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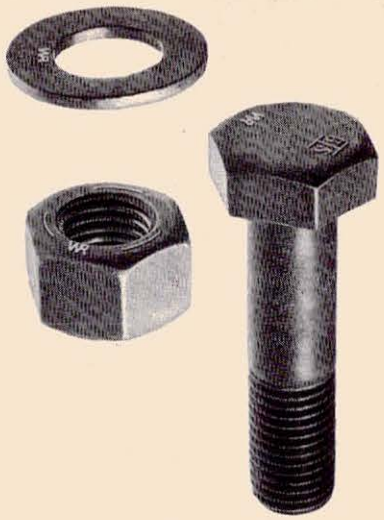

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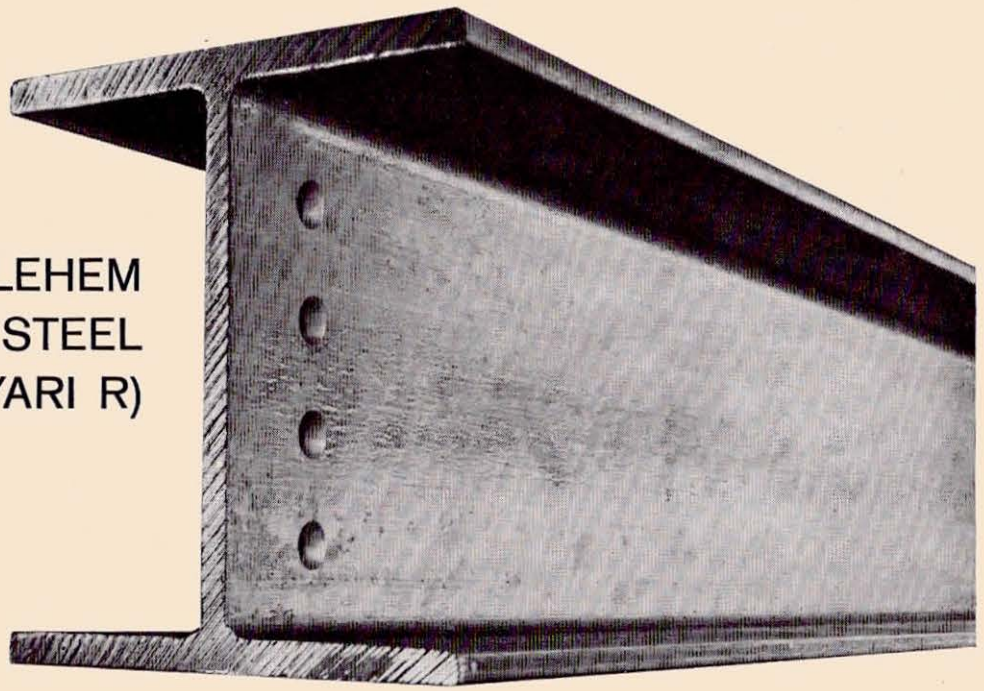

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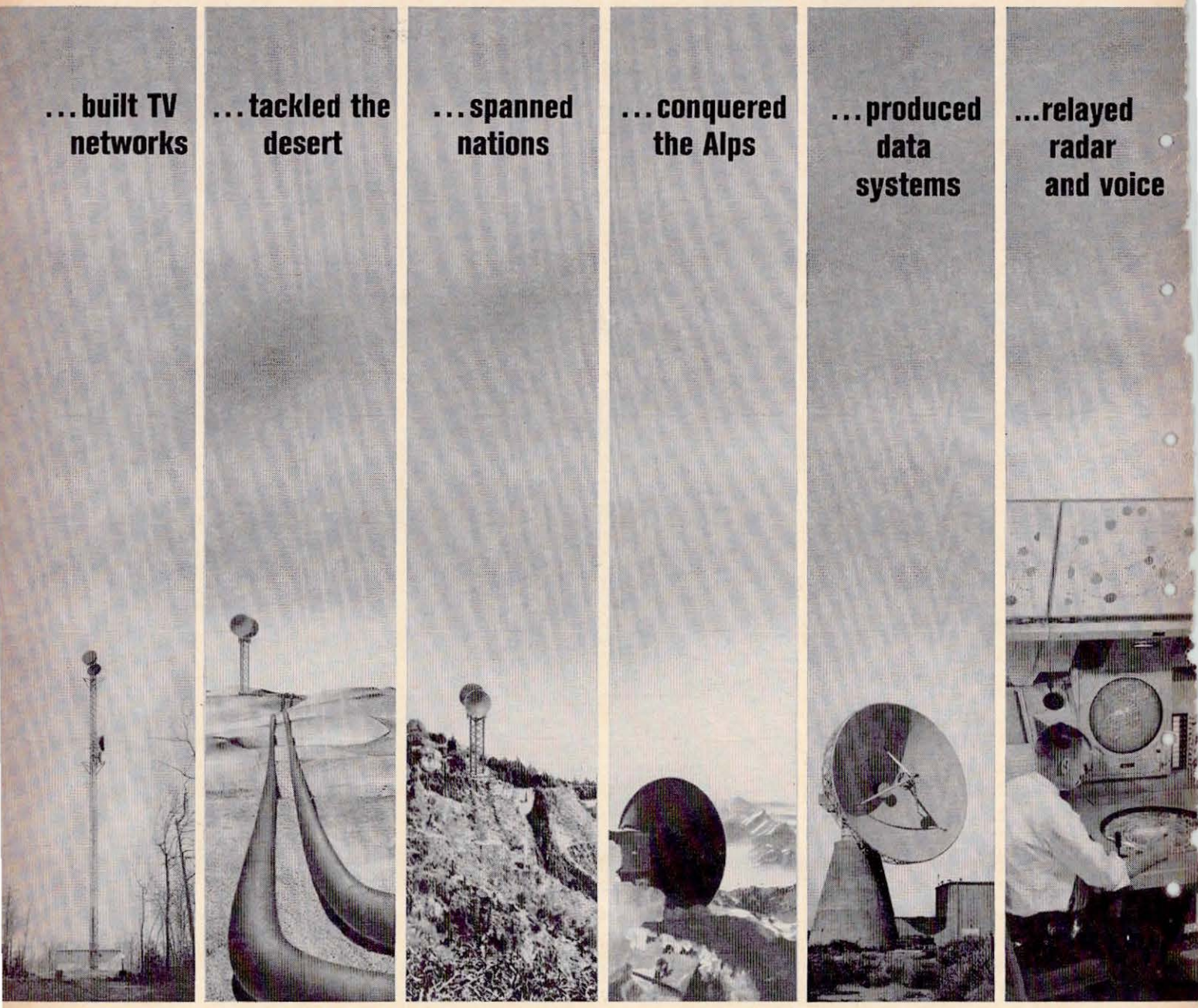

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RAILWAY AGE May 23, 1966 • Vol. 160, No. 20

THIS WEEK

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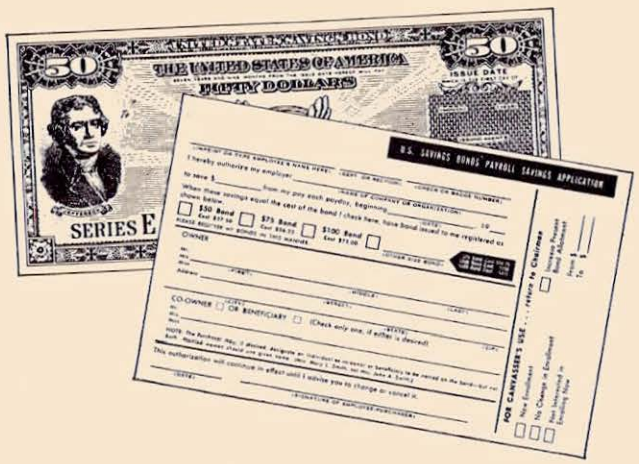

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SHORT AND SIGNIFICANT

Pennsylvania to get new commuter cars

New Jersey commuters who ride the Pennsylvania into New York City every day got some good news from the railroad last week. They were told that their days of riding old equipment on the Trenton-New Brunswick-Newark-New York line are numbered. Soon to be ordered are 40 new stainless-steel, air-conditioned electric commuter coaches that will be able to whisk them into the city at speeds of almost 100 mph. The cars, being acquired with financial aid from the State of New Jersey, are scheduled to be delivered in the summer of 1967.

●

Tri-state planners propose $10-billion, 20-year program

The long-awaited master plan of the Tri-State Transportation Commission for the New York Metropolitan area was unveiled last week. It received mixed notices. The plan called for expenditure of $10 billion over the next 20 years on highway, rapid-transit and suburban railroad improvements. The existing expressway network would be doubled at a cost of $6.6 billion. Suburban railroads would get $820 million. The remainder would be spent on transit improvements in New York City. One proposal was for a $250-million, five-mile transit tube linking Staten Island with Manhattan. The Commission is an official planning agency created by the legislatures of New York, Connecticut and New Jersey last year. Gov. Nelson Rockefeller called the report "a landmark" in transportation planning and offered to work for its implementation. But New York City officials are understood to have serious reservations about some of the report's recommendations, especially those involving highways.

●

UP adds to its '66 spending program

Union Pacific, already spending at record high levels for new equipment, is boosting its 1966 program by $32,157,000—principally for 45 new diesel-electric freight units and 865 freight cars. Says UP President Edd H. Bailey: "Our total rolling stock program will now be about $173 million, which brings our facilities and those of our suppliers to just about the limit that can be delivered this year." Over-all, the program will add 8,063 cars to the road's roster—plus 10 coaches being built by the Pullman Company for UP's Domeliner fleet. Last year, Union Pacific's new-equipment expenditure totaled out at $107 million. And, says Bailey, "already we are planning a program for 1967 [which] should be in excess of $130 million."

●

SP cuts back—but not on rolling stock

Southern Pacific will continue to make heavy investments in rolling stock this year although "in response to the appeal of President Johnson to curtail capital investment, approximately 11% of the 1966 programs other than equipment will be deferred," stockholders were told last week. SP Chairman Donald J. Russell said heavy traffic—due partly to the war in Vietnam—dictates a continued high level of equipment acquisitions. This year, he told the road's annual meeting at Wilmington, Del., SP will acquire 5,137 new freight cars and 172 new locomotives at a total cost of about $133 million. He also reported that SP is installing a $20 million data system scheduled for completion in 1970; and he announced that contracts have been let for a new 78-mile line between Palmdale and Colton, in Southern California. When completed two years from now, the $22-million project will provide a route 46 miles shorter than the present route for traffic between SP's north-south San Joaquin Valley line and its southern transcontinental line running eastward from Los Angeles.

MONDAY MORNING REPORT

AARS will tackle the tough problems again June 8-10

Railroad superintendents, backbone of the industry's managerial force, will start converging on Chicago late next week. Meeting at railtown's Pick-Congress Hotel June 8-10, the American Association of Railroad Superintendents has scheduled a program that reflects the urgency behind communications experts' work on rail microwave networks (see page 18). AARS' meeting, in fact, promises to have something for everyone. When AARS President (and CSS&SB superintendent) W. W. Weber calls the operating officers to order at 9:00 a.m. June 8, they will begin a three-day survey of industry sore-spots.

Committee analyses plus a new approach

A rundown of what the rail industry worries about is usually a good clue as to what AARS committee reports are about. The current reports are no exception. The AARS meeting will be built around formal reports on data processing, piggyback, communications, training and safety. But, there will be more than just papers presented. The AARS promises a new approach to the handling of communications and safety problems. There will be talks by industry leaders. Headliners at the meeting will be such men as Great Northern President John M. Budd, CSS&SB President William P. Coliton, NRAB First Division Carrier Representative E. T. Horsley, and J. A. Paddock, special representative of the AWR and former president of the ORC&B. An outside specialist, Chrysler Corp.'s highly-regarded manager of communication, C. J. Dover, will be there to speak and spark discussion after an AARS report, "Communications—Is Anybody Listening?"

A billion-dollar babel?

Dover is the man who has pointed out that U.S. industry has been spending a billion dollars a year since the mid-fifties to communicate with employees, and that industry has gotten "a sea of words, an avalanche of paper, a babel of noise and a pitifully small return" for its investment. Operating men will hear Dover assess the current situation this way: "It is not failures in economic performance which threaten private enterprise; the real Achilles Heel is the inadequacy of management's efforts to interpret its intentions and performance as a socially-useful institution." GN's President Budd also will have something to say about the importance of effective communications: "In my mind, communications is one of the most important and most neglected areas in the railroad industry."

How do you get better?

The AARS report will note that managers have learned to use every tool except language—and that language is the tool industry's enemies use best. The report explores person-to-person communications, group relationships, individual values, leadership challenges in employee-supervisor communications, and barriers to effective management communications.

You listen, you watch, you read, you write

"Managers can only manage via words" is the gist of AARS' report on communications. "A manager's only tool is the spoken or written word. His effectiveness depends upon his ability to listen and to read, his ability to speak and to write. He needs skill in getting his thinking across to other people as well as skill in finding out what other people are after. The business which relies primarily on oral channels of communications will fail distressingly in accomplishing its communications objectives. Never let information go orally through more than three levels. Written communications is fast, accurate, and much less expensive."

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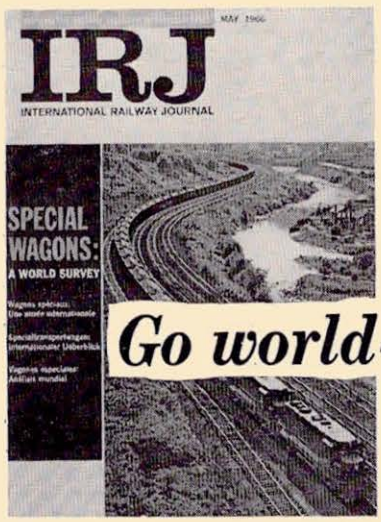

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WEEK AT A GLANCE

Supreme Court ruling firms up railroad tax victory

The railroad industry's bid for freedom from discriminatory taxation was advanced last week by the U.S. Supreme Court. The court refused to review, and thus left in effect, a ruling of the Illinois Supreme Court which requires tax authorities in Madison County, Ill., to make refunds to the Burlington where that road's property is assessed at a higher value than other comparable property. This ruling, and the prior settlement of similar Cook County cases, would seem to indicate that the discriminatory-taxation fight is pretty well won so far as Illinois is concerned.

N&W and C&O stockholders approve railroads' merger plan

A merger plan that would join the Norfolk & Western and Chesapeake & Ohio together in a 26,460-mile system with assets of $5.9 billion won solid support at the annual meetings of the respective roads May 12.

In Roanoke, Va., the stockholders' action was described by N&W President Herman H. Pevler as "a giant step forward" in plans to put together nine railroads in a major new system. He said such a rail network would be "truly competitive with the Pennsylvania-New York Central System and would open up a new era of rail transportation in the East."

In Cleveland, shortly before the C&O opened its annual meeting there, C&O-B&O Chief Executive Officer Walter J. Tuohy was stricken with a heart attack in his Terminal Tower offices. Mr. Tuohy died in a Cleveland hospital later that night.

In an address Mr. Tuohy had prepared for the meeting—and which was read to the stockholders by C&O Vice President Owen Clarke—he characterized the proposed N&W-C&O merger as "one for growth and not for diminution. Our merger does not rest upon cut backs in service or the closing down of facilities, but upon the creation of a system to meet the expanding American economy that lies ahead."

Gregory S. DeVine, C&O-B&O president, said that by the end of May combined gross revenues of the two roads should range around $330 million. "Our financial strength is further enhanced by the excellent level of working capital for C&O and B&O, which amounted to $67 million on April 30."

Expenditures for rolling stock got attention at both railroad meetings. N&W said it will spend about $124 million this year chiefly for locomotives and freight cars of various types. C&O-B&O will spend $175 million, a good part of it for 36 locomotives and more than 13,000 coal cars, merchandise cars and piggyback trailers.

First-quarter profit up $49 million over 1965

Unusually heavy movements of grain and some other types of traffic boosted first-quarter net income for Class I railroads to $172 million—up from $123 million earned in the corresponding period last year. The figures were compiled by the AAR's Bureau of Railway Economics, based on preliminary reports filed by the carriers.

Net railway operating income (earnings from railroad operations before deduction of interest and other fixed charges) was $213 million in the first quarter of 1966, a 30.7% gain over the $163 million in the first three months last year. While first-quarter operating earnings were the best since 1957, 16 of the 76 Class I roads failed to earn their fixed charges.

U.S. CLASS I RAILROADS
First Quarter 1966

	1966	1965
Operating revenues	$2,518,081,653	$2,383,815,162
Operating expenses	1,954,074,041	1,900,097,767
Tax accruals	232,085,715	211,361,779
Rents (net debit)	118,585,885	109,181,158
Net railway operating income	213,336,012	163,174,458
Net income (preliminary):		
United States	172,000,000	122,714,326
Eastern District	45,000,000	28,635,563
Southern Region	27,000,000	27,021,458
Western District	100,000,000	67,057,305

AAR joins yes-but supporters of transport department . . .

The AAR's yes-but position on President Johnson's proposed Cabinet-level department of transportation was explained last week by AAR President Daniel P. Loomis. He told Senate and House Government Operations Committees that the association favors all provisions of the bill except those transfering the ICC's railroad car service and safety functions to the proposed department. As to safety, Loomis made it clear that the carriers don't oppose giving the new department one safety function, i.e., investigation of rail accidents.

Before the Loomis presentation, the AAR had said only that it favored the President's proposal "in principle." As to the car service and safety functions it wants left with the ICC, the AAR says they're interlocked with the economic regulation which the Presidential plan contemplates leaving with regulatory agencies.

. . . and favors investment appraisal provisions

Meanwhile, Loomis strongly supported provisions of the bill that would give the Secretary of Transportation power to establish "standards and criteria for the economic evaluation of federal transportation investments." These provisions have been opposed by subsidized carriers who fear that they might permit the Secretary to veto spending proposals for highway, water and air transport facilities.

The Administration seems disposed to tone down these provisions to get the bill passed. Like the railroads, but for different reasons, most non-government parties are taking yes-but positions.

GUS WELTY'S LINES ON LABOR

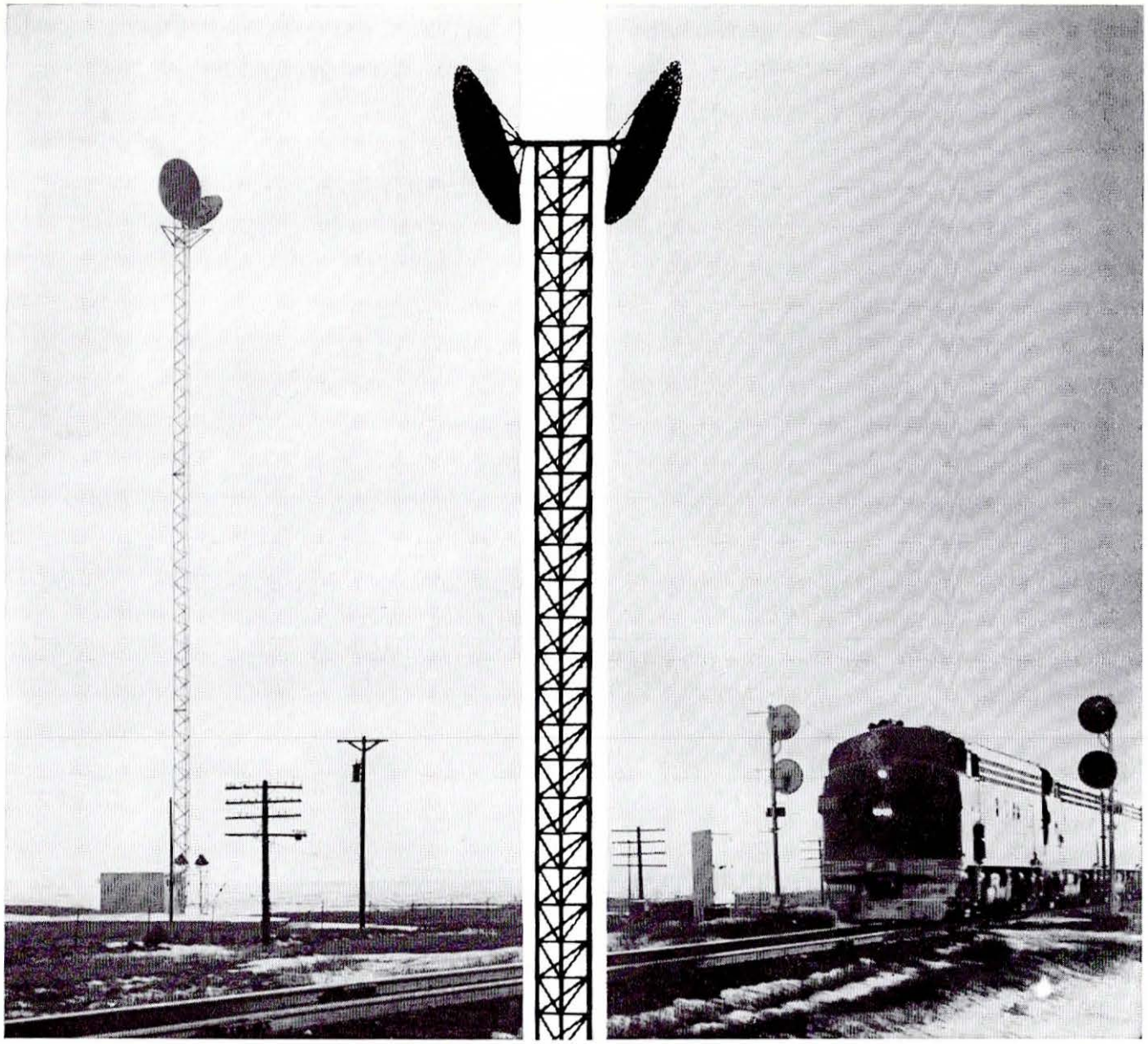
WELTY

LEWIS CARROLL didn't compose the brotherhoods' current wage notices—but so far as railroad labor-relations officers are concerned, he might have. And so the carriers and most of the unions are coming up to a sort of Alice-at-the-Wonderland-bargaining-table situation. Only a few organizations — among them the Brotherhood of Locomotive Engineers—are yet to be heard from. And the most "modest" demands on file now call for wage increases of 18%. There are also notices asking for 20%. And there are two unions demanding 25%. In all cases, the wage-boost proposals are accompanied by impressive packages of fringe-benefit demands.

FOR THE RECORD, and reading from top to bottom, the Firemen and Trainmen are the organizations with dreams of 25% pay increases. The six shopcraft unions of the AFL-CIO Railway Employees Department are asking for 20%. And five unions—the Clerks, Maintenance of Way Employes, Signalmen, Transportation-Communications Workers and Dining Car Employes—are following up on the 18% demand which Clerks President C. L. Dennis indicated last January that his organization would pursue (RA, Jan. 17, p. 115).

THE NATURAL ASSUMPTION is that the unions are working on the old practice of asking for the world in hopes of getting Texas. But in some ways the current wage notices go beyond the "normal" pattern. From the beginning, when the Firemen—under heavy attack anyway—demanded 25% plus fringes, every other organization must have been under heavy pressure. After all, if the BLF&E—with all its troubles—could defy reason, the carriers and the Administration's wage guidelines, could the other brotherhoods (also highly politically oriented) do much less?

PRESSURES NOTWITHSTANDING, members of all the unions had better get used to the idea that there isn't going to be any 25% or 20% or 18%. Possibly, union members and officers have been spending too much time reading railroad financial reports—reading them only as they want to see them. Possibly, the word about increased railroad net income has promoted certain delusions of grandeur—but if it has, it's come only on the union side of the table. The men who will be negotiating for the carriers know better. They're aware that the financial statements of today look good only in comparison with what's gone before. They're aware that good health is still a ways off. Union leaders—if they're at all serious with their demands—have some getting-aware to do.



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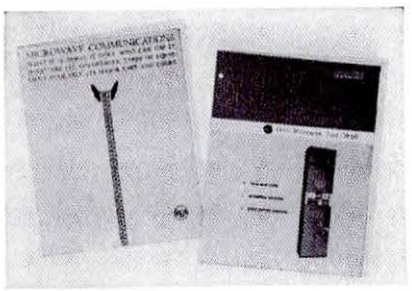

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SIXTY-NINTH ANNUAL REPORT—YEAR ENDED DECEMBER 31, 1965

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Dividends on common stock represented about 55% of adjusted net income after preferred dividend requirements. Preferred dividends declared were 12% less than in 1964 because of preferred shares retired.

A favorable income factor in 1965 was the negotiated settlement of a controversy between Eastern and Western railroads (including Union Pacific) over revised divisions of freight revenues on transcontinental traffic, as prescribed in a 1963 I.C.C. order which was set aside by the courts. Under this settlement, the Eastern railroads relinquished claim to any increased divisions of such revenues for the period July 1, 1963, through August 31, 1965, and Western railroads agreed to increased divisions for Eastern railroads, effective September 1, 1965, which were smaller than those that the I.C.C. order had prescribed. Portions of Union Pacific freight revenue that were excluded from income in 1963 ($3.6 million) and 1964 ($7.2 million) and set aside for contingent payment to Eastern railroads were credited (after adjustment for Federal income taxes) to retained income in 1965. Similar controversy between Western and certain Midwestern railroads is still unsettled but negotiations are proceeding.

Net income for 1965 on basis of accounting prescribed by the Interstate Commerce Commission with Divisional allocations, and as adjusted to conform accounting for Federal income taxes with generally accepted accounting principles, compared with 1964, are shown below:

Net Income	1965	1964	Increase(+)or Decrease (—)
Transportation Division	$79,601,031	$67,788,719	+$11,812,312
Natural Resources Division	11,747,732	13,840,508	— 2,092,776
Land Division	(74,944)	290,876	— 365,820
Non-Divisional	2,481,547	3,543,540	— 1,061,993
Total (I.C.C. basis)	$93,755,366	$85,463,643	+$ 8,291,723
Adjustment—(Deferred Taxes)	(16,680,000)	(14,831,711)	+ (1,848,289)
Adjusted Net Income	$77,075,366	$70,631,932	+$ 6,443,434

The decrease in income of the Natural Resources Division resulted principally from reduced oil production in Patrick Draw and Wilmington fields.

While a small deficit is shown for the Land Division in 1965, its income account is by no means a full measure of its contribution to the Company. The Division's primary function is to foster industrial expansion on the Union Pacific, with emphasis on selling or leasing the Company's industrial sites to traffic-producing firms. Thus the benefits from its activities are reflected chiefly in the Transportation Division's earnings. The Land Division undertook a significant expansion of its industrial land holdings in 1965, such purchases, including those made by subsidiary land companies, totaled 3,270 acres at an approximate cost of $17.0 million.

Expenditures in 1965 for new rolling-stock and other transportation property reached an all-time high of $121.3 million. Capital outlays of such magnitude are an essential measure for providing facilities to expand Company business and for effecting economies to compensate for rising wages and other operating costs.

Public hearings began May 4, 1966, on the joint application of Union Pacific and Rock Island to the Interstate Commerce Commission for authority to merge the two lines, and also related applications by others. Union Pacific and Rock Island will submit extensive evidence to show that their merger would be decidedly in the public interest as well as beneficial to both railroads.

Mr. A. C. Ritter retired as Chief Executive Officer of the Land Division at the close of 1965, after many years of productive service with the Company in various capacities. Mr. Ritter was succeeded, effective January 1, 1966, by Mr. J. W. Godfrey, whose career with the Union Pacific began in the engineering department in 1934. On February 1, 1965, Mr. Godfrey had been appointed Assistant to the President, Industrial Relations, a position which he retains in addition to that of Chief Executive Officer of the Land Division.

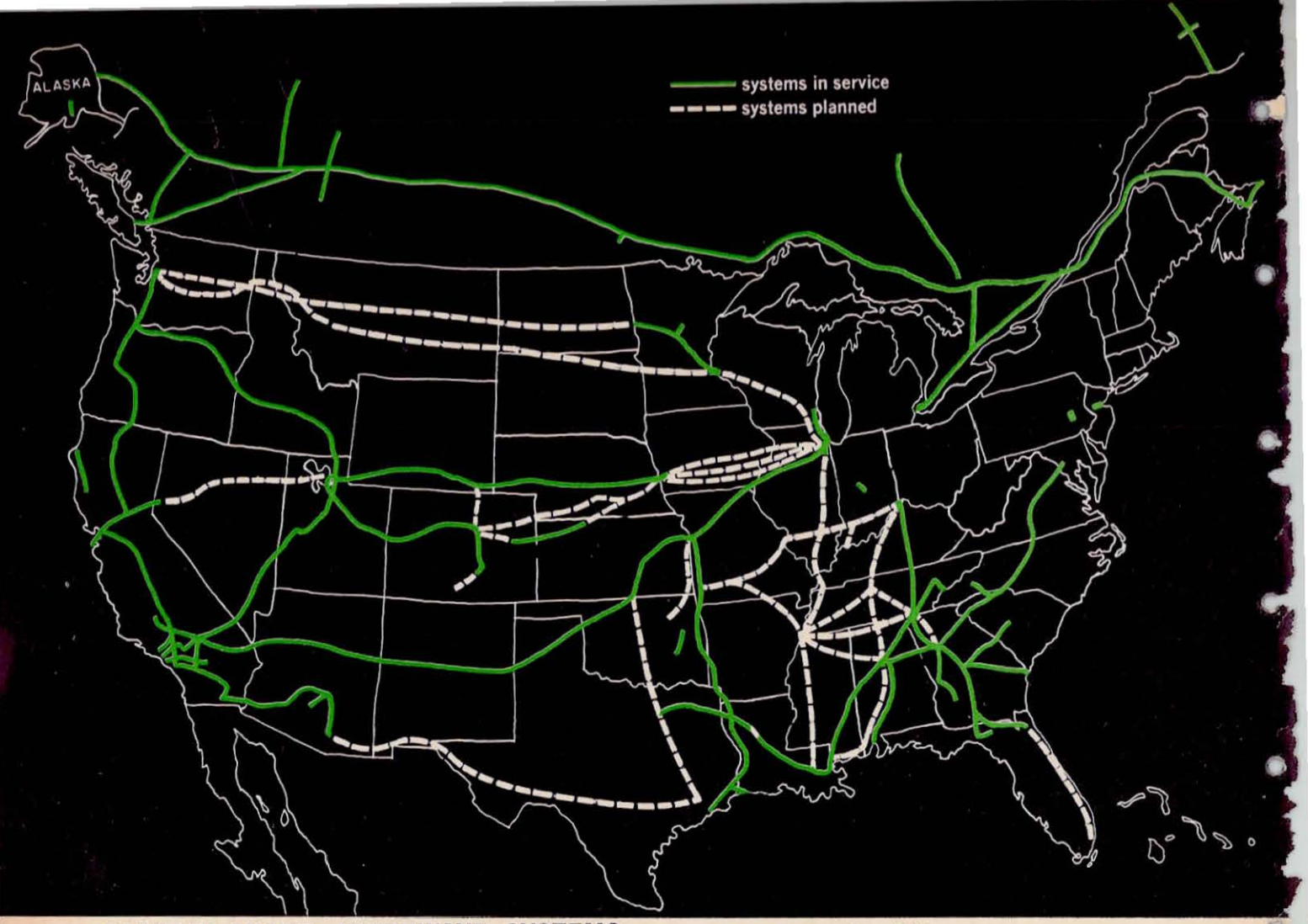
At the meeting of the Board of Directors held on December 28, 1965, Mr. James H. Evans of New York and Mr. William D. Grant of Kansas City, Missouri, were elected Directors of the Company. At the same meeting Mr. Thomas Kerr resigned from the Board.

The Board of Directors takes this opportunity to express its appreciation to Union Pacific officers and employes for their loyal and effective contributions to the success of the Company's undertakings during the year.

E. ROLAND HARRIMAN
Chairman of the Board of Directors

ROBERT A. LOVETT
Chairman of the Executive Committee

EDD H. BAILEY
President



COAST-TO-COAST, MICROWAVE SYSTEMS are fanning out along major rail lines.

Microwave: There's dramatic growth ahead

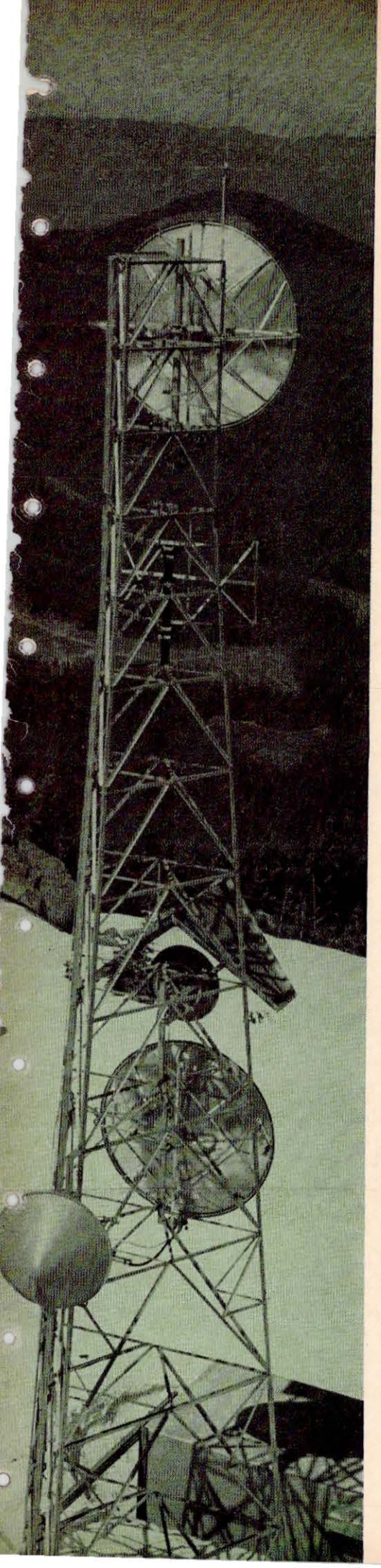
- **A survey of railroads indicates that a U.S.-Canadian microwave network of 50,000 route miles is possible in 10 years.**
- **System-wide microwave, once considered a luxury, is now looked upon as a necessity on computer-age communications.**

BY ROBERT McKNIGHT

The rail industry's microwave map is starting to fill in. With more than 22,000 route miles already in service or ready to be cut into service by the end of the year, one can already trace most important rail trunk lines on such maps. An additional 13,000 route miles of railroad microwave are in the drawing-board or planning stage.

● **The time is ripe.** It won't be long before microwave capability will drastically reduce the railroad's century-long absolute dependence upon copper wires. And it won't be a moment too soon. Explosive growth trends in communication volume are causing experts to rewrite their projections. Rapidly changing operations, on-line computerization and control systems depend upon the carriers possessing adequate communications capacity. Few rail managers dreamed how much would be needed.

Just a few years ago, system-wide microwave was considered a luxury approach to future needs. Now, one communications expert ruefully admits, "It's not a luxury at all. Our demands make it a necessity. We're likely to be chewed out by top management for having



been far too short in our estimates. Properties thought to have been plunging too fast a few years ago are barely keeping up with demand. Saturation of system capacity is getting pretty common. Even advanced roads are seeing their excess capacity evaporate almost overnight."

● **50,000 miles of microwave?** Experts predict that 35,000 route miles of microwave will be in service by 1970. The accompanying map shows only those microwave systems in service, under construction or in planning stages. The latter category includes microwave systems that railroads would install if money is available. A Railway Age survey of 35 major railroads in the U.S. and Canada indicates a microwave network of 50,000 route miles is entirely possible in the next decade.

Several roads indicated that if American Telephone & Telegraph Company's Telpak tariff (now under federal court review) should be revised with higher rates, microwave possibilities will be restudied. With improved business and economies effected by mergers, it is likely that railroads will be investing money in the communications foundation required for eventual computerized control of operations.

● **More system-wide study.** Much of the growth of microwave in the past, and in the future, will result from over-all system studies of railroads' communications needs. "Microwave," comments one road's communications engineer, "is only a tool—admittedly a big one with lots of leverage—to provide a communications plant with flexibility, reliability and expandability."

Southern's Assistant to Vice President —Communications N. C. Pace says: "Management is well aware of the need for superior communications facilities. If we are not extremely careful in our planning, we might find ourselves trying to justify inadequate plant design instead of high plant cost.

"Certainly, we must always consider economy in our planning. But only by taking a real broad over-all look can we avoid being trapped into false economy. We all know that voice grade data systems, the old 5-channel, 60-word-per-minute teleprinter system, for example, offer perhaps the ultimate in economy—that is, economy in bandwidth versus bit rate. But not necessarily in dollars and cents.

"When total information flow is a requisite, the broad look reveals that wide-band, high-bit-rate data systems can effect real economy."

● **Growth can be long range.** Where an over-all systems study has been made on a railroad property, total system cost, while large, has not deterred management from deciding in favor of the microwave-oriented communications plant. Southern has spent about $28 million for its 4,100-mile microwave system.

Although some railroads have capitalized their microwave systems, others prefer leasing. One microwave equipment manufacturer suggests that any of three approaches may be considered because of the economics of obtaining a total communications plant having a longevity of 15 to 25 years:

—A total system can be planned, and then through outright purchase, capitalized by the railroad and implemented all at once or on a sectional basis. To truly appraise the return on investment of this approach, maintenance projections must be made as well as a determination of the total circuit requirements of all departments in the railroad operation.

—A wholly-owned subsidiary of the railroad may own the communications plant and contract maintenance to an outside source.

—A third approach could be a completely leased, maintained communication system operating on the railroad right-of-way with a consolidated monthly billing. This approach could utilize total system implementation or a planned sectional increase until all communications requirements are covered. This kind of system would be covered solely by operating money.

● **Technological obsolescence?** When considering multi-million dollar, system-wide microwave, railroad managers worry about obsolescence. Astute managers don't spend millions on systems with high technological change characteristics. Rail microwave systems, however, are now developed to the point where new break-throughs in technology don't seem likely. Today's microwave hardware, say manufacturers, is technically capable of covering communications requirements for the next 20 years.

Manufacturers, in fact, are spending more and more money for research and development on products sold to the railroad industry. One manufacturer reports spending 10% of sales to railroads on R&D for products and techniques aimed at the railroad industry.

● **What are other costs?** Not all microwave system cost is for hardware. The hardware runs to about 55-60% of system cost, railroads reported in the Railway Age survey. A manufacturer provides this estimate: systems engineering—8 to 15%; installation—10%; RF (microwave transmitters and receivers)—17 to 20%; carrier multiplex (channelizing equipment), wiring, etc.—30 to 35%. As much as 5% of total system cost may go for acquiring sites off-line. This drops to 1% if microwave stations can be located on the right-of-way.

MICROWAVE:

Railroads were wise to get the message

Development of microwave systems has proved to be a sound decision for the rail industry.

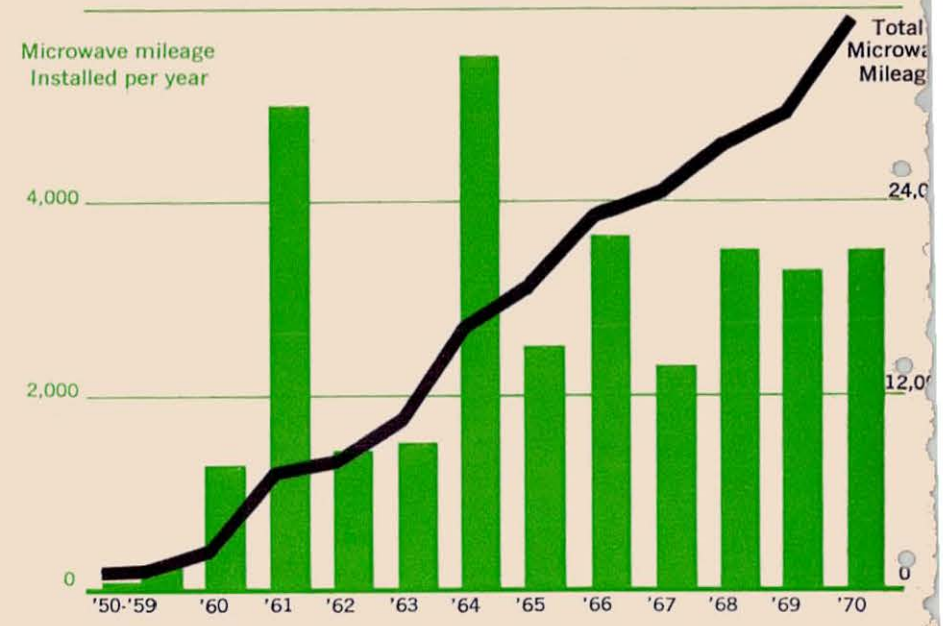
Microwave's prophets twenty years ago may well have been right—for reasons they couldn't possibly have foreseen.

Microwave was no instant answer to steadily growing rail industry communications requirements. It was too expensive, for one thing. For another, there was a massive amount of industry investment already tied up in industry-owned facilities. For yet another, there were strong bids being made for the industry's communications business by telephone companies.

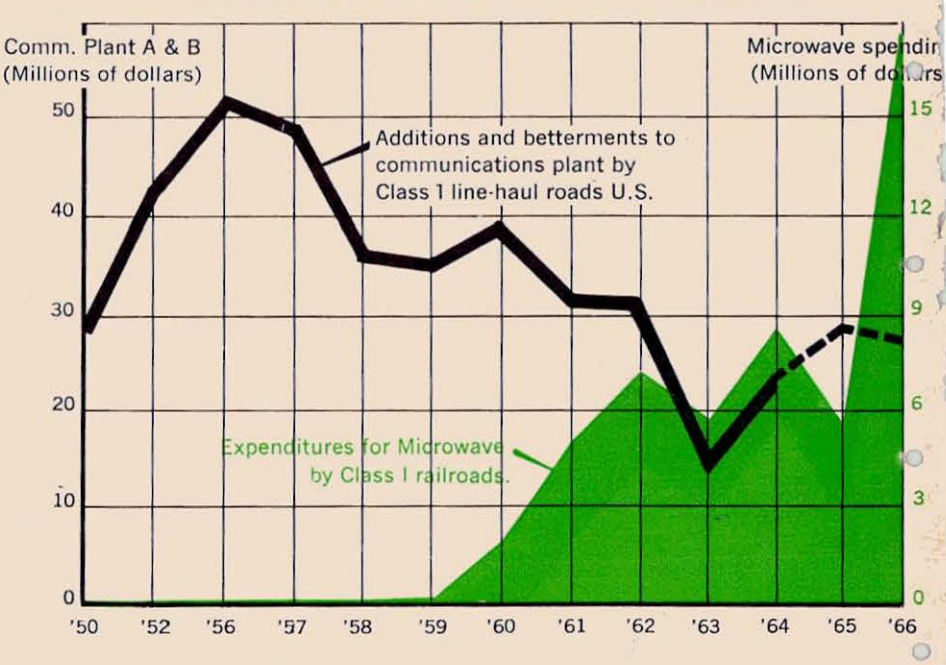
On top of these negative factors, the state of the microwave art was such that it could be economically justified only in special cases. Too, the Federal Communications Commission, which had not envisioned private users' needs for microwave rights-of-way, would for years grant licenses only on a developmental basis.

● **What changed?** The first microwave installations in the rail industry were made despite these handicaps. Santa Fe's installation of microwave in 1952 between Beaumont and Galveston, Tex., jumps 68 miles over Galveston Bay—thereby eliminating the need for several hundred miles of additional circuits. Rock Island installed 106 miles of microwave between Norton and Goodland, Kan., because that territory's sleet storms made pole lines unreliable.

MICROWAVE'S YEAR-BY-YEAR GROWTH



MICROWAVE EXPENDITURES GET LARGER



The big impetus to expansion of microwave mileage, however, came in 1957. The FCC recognized the need of railroads for their own microwave systems. Despite protests by telephone and telegraph companies, the FCC set aside a band of frequencies in the 6,000-megacycle range to be used by railroads, pipelines and utilities.

● **System demands soared.** Even as microwave technology was being refined and the regulatory restraints loosened, the industry's demands for communications capacity began to skyrocket. By the time the FCC acted in 1957, the first generation of computers on U.S. railroads was creating strains on conventional communications systems. A new generation of industry managers began pushing for internal efficiencies that could be realized only if greatly expanded communications capacity was available.

Equipment-utilization programs, hot-box detection systems, management-control programs based upon computer capability and other industry advances began straining the industry's communications capacity in the late Fifties.

● **Microwave mileage jumps.** Microwave installations will have gone from practically zero in 1957 to about 22,000 route miles by the end of this year. Reliable estimates of the microwave outlook indicate 35,000 route miles on railroads by 1970.

Money already spent for microwave systems by U.S. Class I roads totals

some $54,900,000. Sizeable though this sum is, it represents only 1% of the money spent by the same roads on total additions and betterments to communications plants during the same period. Evidence points to an increasing level of spending for microwave in years ahead, both absolutely and as a percentage of industry communication expenditures.

● **The outlook is bright.** Existing microwave systems are proving out for the communications officers in the industry who gambled on the trends in recent years. Both the reliability and capacity of such systems have silenced critics who once demanded proof that microwave systems could eliminate pole-lines before they would admit the economic rightness of microwave decisions.

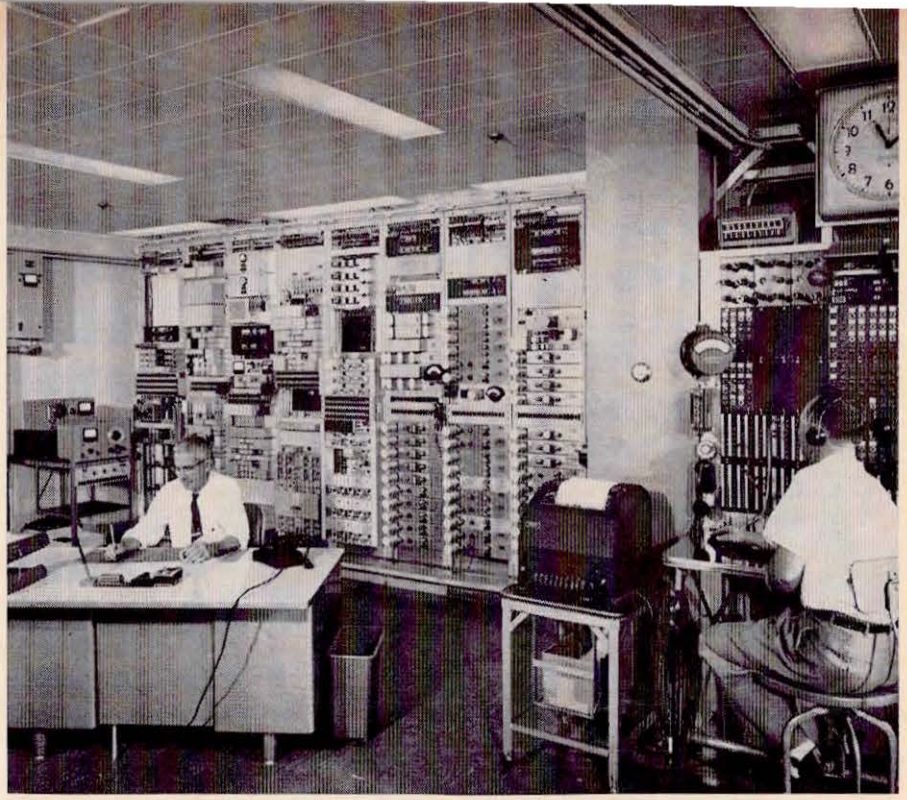
Now, with message, voice and data traffic straining all available circuits on many properties, it is more and more apparent that microwave's "big pipe" potential may make it the only answer to the industry's needs. Experts feel microwave has the capacity, reliability and flexibility to serve as the spinal cord for industry communications plants.

● **Microwave's potential.** A top communications consultant makes this point: "Control of operations envisioned by on-line computer advocates requires substantial communications back-up. Railroads must have on-line communications to really engineer the control breakthrough they're working on."

For example, the requirements for broadband channels are easily seen. They have to handle message traffic, voice traffic and data-systems traffic. Also, there are centralized traffic control systems, dispatcher-controlled radio facilities for communications from wayside to trains, hotbox-detector systems, high-wide load warning systems, and, on two roads, facsimile transmission stations. Administrative messages, with this complex requirement, need integration into automated store-and-forward switching systems to maximize on-line communications circuitry.

Closed-circuit TV surveillance systems, automatic car identification systems and other control and indication devices that can be hung onto communications networks—make one thing awesomely clear. Railroad communications facilities are approaching the importance of right-of-way, motive power and rolling stock.

● **New uses will grow.** More and more obvious to the industry's communications experts is the fact that the information explosion in the industry is transforming industry requirements in ways that can't yet be fully charted. Notes Louisville & Nashville Engineer Communications-System M. R. Williams: "The biggest user of rail microwave is going to be microwave facsimile transmission. I doubt that present systems of waybill data communications will be enough. Other, more efficient systems will be developed. They will require the kind of high-speed volume that only microwave can provide."



MICROWAVE EQUIPMENT at a major terminal may be located in a communications test room. Here, the testing and proper adjusting of communications circuits is handled.

MODULAR CONSTRUCTION, using the building-block principle, makes for ease of maintenance, testing and replacement of microwave system components and sub-systems.

Denver & Rio Grande Western and Southern are already using microwave capacity for facsimile transmission. Other railroads are studying the matter.

N. C. Pace, assistant to vice president-communications, Southern, states the case for facsimile transmission this way: "All information for complete control of car movements is on the car's waybill. The best method for capturing and handling this information is afforded by the graphic or facsimile system. While costly when only bandwidths or bit rates are considered, the vast number of redundant bits transmitted in such systems offers a tremendous assist toward error-free data—an absolute must for on-line computerized control of operations.

"These systems enable data to flow into a computer's innards with only one human translation. If we could just standardize our forms and type fonts, this single translation could be eliminated. Optical character recognition and translation devices are already here."

● **Over-all control.** What microwave's promise adds up to is nothing less than this: It seems to be the best handle for railroad officers to grasp in efforts now being made to have central control and immediate information for entire rail operations.

Says Southern Pacific President B. F. Biaggini: "What we expect to achieve on a gigantic scale is the ability to observe at a single glance the operation of an entire system. We need to have available, at every level of supervision and at every point of action, the information that responsible supervisors and employees at that point need to do a superior job of up-to-date railroading."

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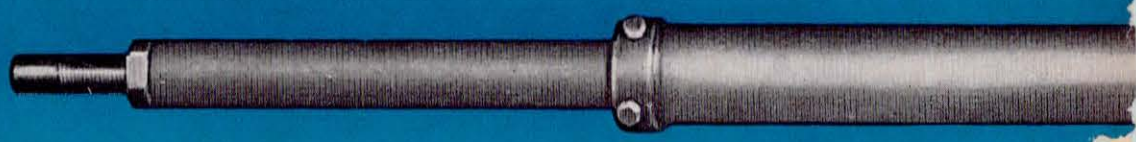

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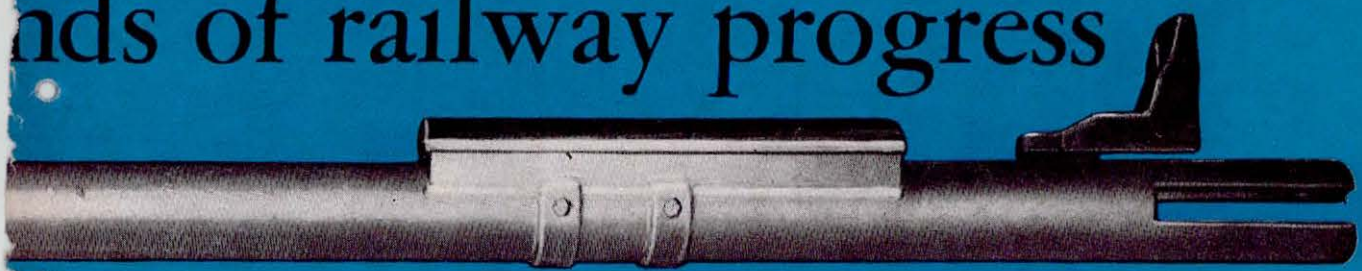

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MICROWAVE:

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The growth of information traffic every year is making railroads appreciate microwave's value for both present and future needs.

Microwave, with its "big pipe" capacity, reliability and flexibility is meeting the changing communications requirements of railroads.

Rail communications needs are growing. The type of communications traffic is changing, too.

● **Tremendous growth.** For years telephone and telegraph traffic characterized railway communications. In recent years there has been a tremendous growth in data communications. Such volume is rising 40% per year. While much of this is handled by 100-word-per-minute teletypewriter circuits, two railroads have found such handling inadequate and are using facsimile transmission for getting waybill information into computers. Other roads are using 2,400-bit-per-second data circuits.

A Railway Age survey of 35 railroads indicates about 30% of the industry's communications plant is devoted to data transmission. This figure, according to experts, will rise. Also ahead, in the view of industry experts, is the belief that changing economics of totally integrated communications systems (forced by the demands of industry computers) will cause some roads to switch from leased facilities to privately-owned systems.

● **Message and voice up, too.** As indicated by the survey, voice traffic volume is rising at the rate of 25% per year. This figure may be low because some roads report saturation of voice circuits. Message traffic is rising only 8% per year. Much of the former message traffic is now handled in voice form, due to the convenience of direct-distance-dial telephone service. Two railroads surveyed said that their administrative message traffic is falling about 3% per year because of this increased use of dial telephone service.

Experts say the saturation point for dial-telephone service will be reached when it is not economical to install additional circuits to eliminate practically all busy signals. Most railroad communications men think that that day is a long way off.

As for message traffic, there might well be a general decline as data-transmission facilities and dial-telephone service expands. Generally, most experts think there will always be an irreducible minimum of administrative message traffic. But this minimum may be handled in a different manner than it is today. As voice-circuit capacity increases, it may be feasible and economical for administrative messages to be telephoned to a central dictating service for transcription, with delivery ultimately by facsimile transmission.

● **Rail managers alert.** Although there are dissenting voices, it is widely agreed that railroad officers are generally aware of the importance of communications and of the increasing importance of microwave to the industry's future needs. One communications officer says it is important to make the distinction between microwave systems and other communications facilities. "Once our microwave system was in service, it was the 'savior,' and also the 'goat' so far as our management was concerned. If one of our executives had a telephone call go astray or received a garbled message, it was the 'fault of the microwave system.' We had to educate our officers to the facts of communications life, namely that the microwave system was only one part of our over-all communications plant."

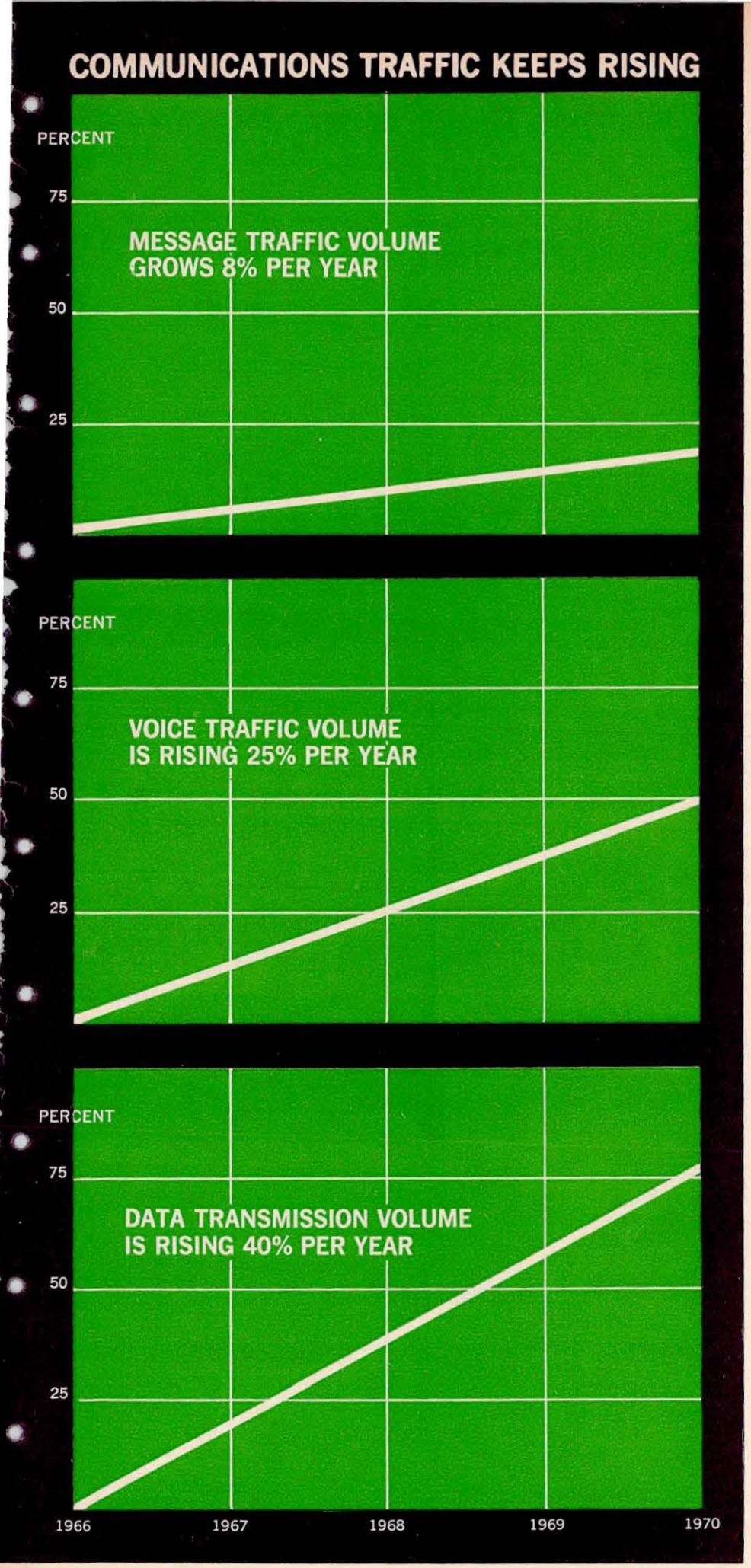
● **Chain reaction.** Microwave has enabled consolidation of operating offices on some railroads, because of the improved communications it was able to provide. One railroad reduced its operating divisions 50% after a microwave-oriented total communications system went into service.

"Microwave doesn't cost money, it saves money and pays for itself," states one eastern communications engineer. Survey results indicate that microwave permits reduction in line-wire circuitry. Some railroads have been able to eliminate pole lines where microwave has been installed, but not on any predictable basis. Some roads, in fact, found they needed all available circuits as over-all demand rose faster than new capacity was installed.

Also, many railroads have been able to drastically reduce or eliminate leased facilities for on-line communications.

● **Weatherproof.** As for reliability, microwave is "just about tops," to a western-railroad communications supervisor. Southern's President Brosnan has pointed out that microwave installations provide greater reliability because they are not vulnerable to snow, ice and heavy windstorms.

Commenting on such reliability, SP's John Albertson, general superintendent of communications, system, had this to say: "One of SP's microwave paths is presently giving us a reliability of 99.99658%, or approximately 15.81 minutes per year of downtime due to multipath fading. By applying space diversity to this path, the reliability factor is increased to 99.9999% or approximately 32 seconds of downtime per year."



MICROWAVE: WHAT THE EXPERTS SAY

"Although rail managements are learning fast, there is still a need for them to spell out what they want in the way of information requirements. A manager must know the type of information he needs to manage better. Once this is defined, the communications expert can provide the necessary hardware and systems to provide that information at the right time at the right place to the proper persons."

"There is a definite need for an economical microwave system for light and medium traffic lines. What we need is a microwave system that would cost less than the conventional pole line with only message and dispatch circuits. A compact-car version of mainline microwave systems would be a boon to improving branch line operations."

"There is no doubt that communications linked with data processing is the key to automation. Without communications, automation would come to a standstill. In this day and age communications costs cannot be weighed solely against savings in the communications area, but must be measured as part of an integrated system producing a return on the investment to the entire company. Planning and selling must be a joint effort between communications and other departments of the railway."

"The data explosion and the need for current and accurate information has focused attention on the need for more and better communications. Now is the time to bear down on the need for a first class communications system for the entire railroad—an integrated management information system."

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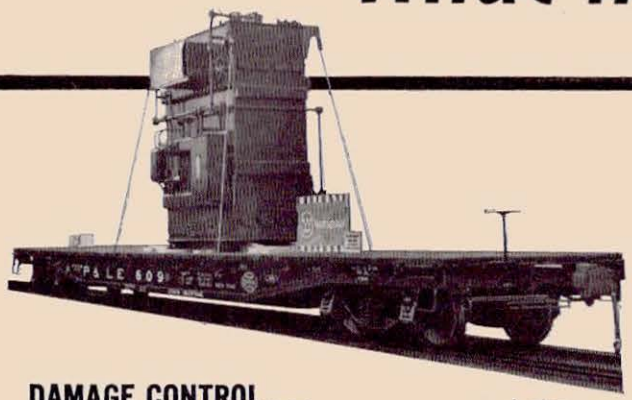

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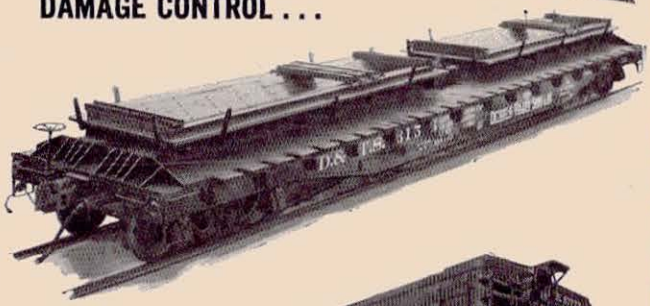

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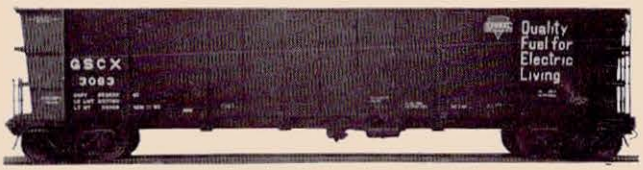

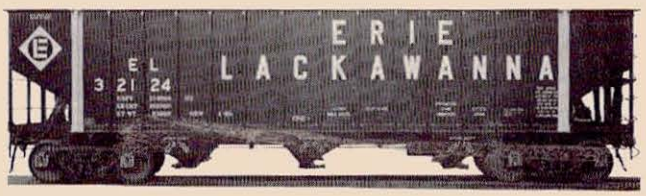

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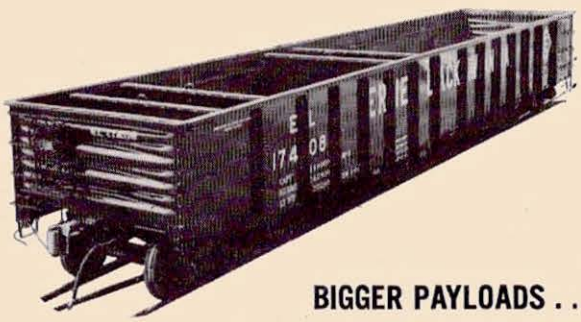

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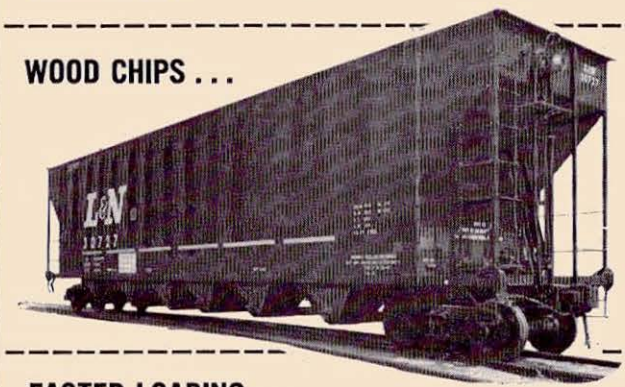

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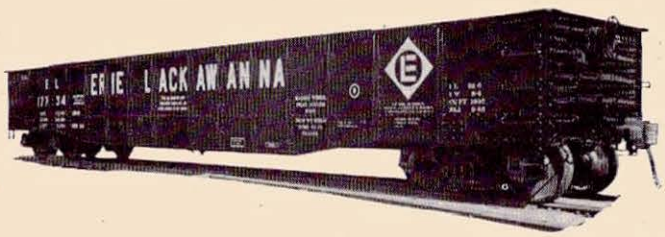

All of these cars rolled off the big Greenville lines during the past year. They represent the rare combination of versatile car designs and production skills which make Greenville an uncommonly good place to start in selecting the best car for the job. A car doesn't have to be a special to be efficient. A Greenville modified standard may do the job just as well. What will help you most? Talk to Greenville about it. The answer may already exist.

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PROGRESS REPORT

Automation closer as ACI advances

AAR issues specifications for automatic car identification; half-dozen systems subjected to individual railway appraisals.

Automatic car identification appears to be coming down the home stretch in the race for railroad automation. Last month, the AAR's Data Systems Division and the Research Center issued functional specifications for an ACI system to be adopted by American railroads. Additionally, at least four U.S. and two European ACI systems have been tested or are undergoing tests on railways. Microwave is playing a role in this development, too.

● **First for captive cars.** Duluth, Missabe & Iron Range was the first railroad to buy and use an ACI system as a daily operating tool. DM&IR purchased Sylvania's Kartrak system. It was fully operational by the start of the iron-ore shipping season in the spring of 1965.

Scotchlite reflective labels were applied to 9,500 hopper cars and 88 locomotives. The labels, mounted on each side of a hopper car, are made up of combinations of black, blue, orange and white horizontal stripes, which indicate car number and light weight. Similar labels on locomotives have two digits to identify the motive power units to the ACI system and three digits to identify the locomotive number.

In addition to labeling, the ACI system on the DM&IR includes two wayside scanners and a decoding unit at the Proctor, Minn. yard. There, loaded ore cars are weighed before delivery to docks at Duluth. As loaded cars are moved toward a track scale, a Kartrak scanner reads car numbers and light weight. At the scales, the gross weight of each car is matched against the light weight, and the net weight is automatically calculated. This net or ore weight is fed to a teleprinter tape punch. This ore weight, along with its associated car number, is fed via teleprinter circuits to other yards, docks, DM&IR's operations center and to the mining company's offices.

After weighing, the cars are made up into trains for delivery to the docks at Duluth, Minn., where the ore is dumped into lake boats for shipment to steel mills. As trains leave Proctor yard, another ACI scanner reads locomotive numbers and car numbers to verify the train consist.

● **Rapid transit to have ACI.** Next month the Chicago Transit Authority will begin labeling 1,200 rapid transit cars. The binary coded sign will consist of retroreflective Scotchlite and non-reflective vertical stripes. A label will be on each side of the car to represent the car number. CTA will use an infrared ACI system made by Union Switch & Signal division of WABCO.

Four scanners will be installed at three key locations to obtain car numbers. At Howard Street, northern terminal of the north-south subway, ACI equipment will scan north-south trains, Skokie Swift cars and Evanston line cars. At Lake and Wells Streets in Chicago's Loop, ACI will scan Lake Street trains, Ravenswood El trains and Evanston Express trains. ACI scanning equipment at Loomis Junction on the Congress line will read car numbers on Congress and Douglas Park trains.

The US&S-WABCO ACI system will pick up car numbers and transmit them to CTA headquarters in the Merchandise Mart. The information will be printed on a teletypewriter paper tape, which will be fed into an IBM tape-to-card machine for input to a digital computer. The data will enable CTA to

THE BIG FOUR IN ACI

Abex Corp. In this system microwave energy (about 35,000 megacycles) is beamed from a transmitter mounted at trackside toward a metal tag (about 28 inches long). The tag is mounted on brackets attached to the freight-car truck side frame. Slot-type dipole antennas on the car tag radiate the energy back to the wayside unit, where the electrical signal is decoded, and the car initial and number are then printed out.

●

General Electric Co. The car-carried unit containing piezoelectric elements is mounted under a freight car at a height about 5 inches above the top of rail. When this car unit passes over transmitting-receiving antennas mounted between the rails, radio-frequency coupling takes place. The transmitting antenna in the track unit sends an electrical signal to the repeating antenna in the car-carried unit. This action causes the piezoelectric crystals to produce electrical signals that are sent to the receiving antenna between the rails. The received electrical signal is decoded and the car identification read out.

●

Sylvania Electric Products Co. Cars carry Scotchlite retroreflective labels consisting of horizontal colored stripes with combinations of black, blue, orange and white. Light from a wayside unit is beamed off a multi-faced rotating mirror toward the passing label. Scanning is vertical. The reflected light off the label is received through a dichroic mirror which reflects orange and transmits blue light. The blue and orange light is then received by photosensitive units which produce electrical signals that are decoded.

●

Union Switch & Signal division of WABCO. Cars to be identified are equipped with vertical 3M retro-reflective stripes interspersed with non-reflective stripes. The stripes form a binary coded sign. As the car passes, the wayside scanner emits infrared light which hits the car label and is reflected back from the retro-reflective stripes to a photocell in the scanner where it is converted into electrical signals, which are then decoded to produce a read-out initial and number.

Scanning is horizontal—the wayside unit "reads" along a ½-inch path across all label stripes. However, US&S is now working on the development of a vertical scanning system, which may be available this fall.

AUTOMATIC CAR IDENTIFICATION system has been in service for more than a year on Duluth, Missabe & Iron Range.

maintain a precise up-to-date mileage record of all cars in service. Maintenance scheduling on CTA is based upon mileage traveled by cars. The 1,200 cars operate over three major routes covering 72 miles of trackage.

• **Other systems on test.** An ACI system that uses microwave energy to scan metal tags mounted on truck sideframes of moving cars is manufactured by Abex Corp. (formerly known as American Brake Shoe Co.). The Abex system is now on test on the Denver & Rio Grande Western. A wayside scanner is located about 20 miles west of Denver in the Rocky Mountains. The tags contain 4 letters and 6 digits, and are mounted (one on each side) on 125 hopper cars operating in semi-captive coal service. Information is printed out at Denver, Colo. Information provided on the printout includes: (1) scanner location, (2) direction of train, (3) time of day, (4) calendar date, (5) positive identification of tagged cars (4 letters and 6 digits) with internal validity check. The untagged cars in the passing train are identified with the symbol NT.

General Electric Co.'s ACI system is on test on the Pennsylvania near Altoona, Pa. Inert antennas are mounted on the underside of a locomotive and cars of a 70-car coal-hauling unit train. Radio frequency coupling between the antennas on the rolling stock and fixed antennas mounted between the rails provide the transfer of identifying information. Cars are identified by 3 letters and 6 digits. Readout equipment is at Spruce Tower, 15 miles east of Altoona. Data are also transmitted to Enola yard, near Harrisburg, Pa.

• **European ACI development.** Two European ACI systems have been tested under railway operating conditions. One was tested for the British Transport Commission. This was a joint effort of General Electric Co. of England, Ltd., Salford Electrical Instruments, Ltd., and International Computers and Tabulators, Ltd. In this system, the scanning device projects a beam of light on coded number plates mounted at the axle level on the passing cars. The reflected light from the coded plates is focused on two photo-electric cells. After electronic decoding, the data is fed to a storage unit and held in a ferrite core matrix. Once the train has passed, the information goes to the transmission unit which feeds it to a data processing center. The system is designed to read and record at speeds up to 60 miles per hour.

A member of the Philips group—Spoorweg Sein Industrie—has made extensive tests of its ACI system on the Netherland Railways and the SNCF (French Railways). This system uses the inductive coupling principle with electrical energy in the frequency range of 50-130 kilocycles.

Equipment at wayside

In this system a 12-digit code is used (a requirement of UIC, the International Union of Railways.) The car-mounted unit (about axle height) contains a receiving loop, printed wiring board and integrated circuits. At wayside is equipment including a transmission loop. As soon as the car-mounted unit enters the field of a transmission loop, set up besides the track, inductive coupling takes place between this loop and a receiving loop in the car unit. The wayside unit transmits 15 kilocycle AC which is induced in the car-mounted receiving loop. This AC is rectified, feeding 5 code oscillators. These units simultaneously emit signals which are received by the wayside unit. The wayside equipment decodes the signals and produces read-outs indicating car number.

The equipment can make three complete read-out cycles of a 12-digit number on each car of trains traveling up to 100 miles per hour.

• **Development stage for others.** Two other European manufacturers and at least one American manufacturer are known to have made limited tests of ACI equipment. They include Siemens & Halske (an inductive system, and reportedly also a microwave system, and Standard-Elektrik-Lorenz (ITT) using an optical system.

In this country, Radio Corp. of America is reported to have developed a radio frequency system. In this system a high frequency pulse is intermittently sent from a wayside control point via coaxial cable to a track loop which serves as a transmitting-receiving antenna. As the car passes over the loop, the pulse causes crystals in the assembly mounted under the car to oscillate at their respective frequencies. At the end of the transmitted pulse, the signals are picked up by the track loop and sent over the cable to the wayside control for decoding and transmission to a read-out unit. The decoded signals identify both the car number and the railroad.

• **Field gets narrower.** From the above it is apparent there are many contenders for the ACI business of American railroads, However, AAR specifications will probably narrow the field considerably. For example, a major modification is the requirement to be able to read piggyback trailers, containers and stacked containers. While not a requirement of the basic ACI system, it can be a demand of a railroad or all railroads. "The ACI system that can read trailers and containers as well as freight cars has a lot going for it,"

Tell us what liquid you want to ship. We'll supply the tank cars.

Got a hard-to-hold product? We'll hold it. Must your product be protected against contamination? We'll protect it. Worried about flavor preservation? We have tank car designers who are gourmets, too. Whatever your product, you can lease GATX tank cars to exactly meet your requirements. And you know how much better it is to lease, than getting yourself into the problems of the tank car owning and maintenance business.
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comments a midwestern rail manager.

Consider also the requirement that the freight car label must be installed in typical train yard locations without requiring special movement to service tracks. "That means no rip track moves, and no crawling under cars to put on tags," comments a western road trainmaster.

By June 30 (the deadline for ACI proposals to the AAR), the AAR will have a good idea of who is really interested in providing an ACI system for American railroads. It's worth going for. About 2,000,000 freight cars (private as well as railroad owned), some 17,000 locomotives and possibly 1,000 scanners will be involved—as a starter.

● **More communications.** When an ACI system is accepted by the AAR, there will be a big jump on many roads for communications to handle data from scanner sites.

"For ACI to be effective, many reporting points for indentification will be required. Information from these points will be directly transmitted into a computer complex where the information will be assimilated and made readily available by the flick of a dial or keyboard to doers at any place on the system," says N. C. Pace, Southern's top communications officer. Many experts think the solution to the multi-point data pickup required by ACI is use of a microwave-based system. ■

It takes a lot of manufacturers to put together a system

Spending for microwave is now running at an annual rate of about $5 million. The outlook is for this rate to hold—or improve—in the years immediately ahead

● **Who makes what.** The manufacturers who make the basic microwave equipment are, by and large, not normally thought of as railway suppliers. Such firms as Collins Radio Co., Farinon Electric, General Electric Co., Granger Associates, ITT-Telecommunications, Lenkurt Electric Co., Inc., Lynch Communication Systems Inc., Motorola Communications & Electronics Inc., Radio Corp. of America and Raytheon Co. will share this market.

However this is only part of the microwave system package. About 30% of microwave system costs include channelizing equipment such as multiplex and carrier systems. Companies such as Canadian Aviation Electronics, Ltd., Cardion Inc., Communication Equipment & Engineering Co., Harmon Electronics Inc., Marconi Co. Ltd., Moore Associates Inc., Noller Control Systems, Inc., North American Philips Co. Inc., Northern Radio Co., Pacific Communications & Electronics Inc., Radio Frequency Laboratories, Inc., and Stromberg-Carlson Corp. will share in this part of the microwave market.

● **Antennas and towers.** Other hardware necessary to a microwave system includes antennas, passive reflectors (to bounce microwave signals around an obstruction), and supporting towers for these devices. A shopping list of suppliers of these devices would include Advance Industries, Air Space Devices, Inc., Andrew Corp., Communications Products Co., Gabriel Electronics, Microflect Inc., Prodelin Inc., Rohn Manufacturing Co., Stainless Inc., and Technical Appliance Corp.

Microwave systems now being installed and many now in service operate on 12-, 24- or 48-volt DC. Thus, batteries, battery chargers and rectifiers are often used at microwave stations. In many instances, the microwave equipment operates on a combination of battery and rectified AC voltages. The AC is usually local commercial power.

To assure reliability, a standby power plant is also provided to generate AC in case of failure of the commercial supply. In mountainous areas where commercial power is not available, two engine-generating plants are used to furnish AC—one is normal and the other is a standby plant.

Some of the more prominent suppliers of this type of equipment and housings are Armadillo Manufacturing Co., Armco Steel Corp., C&D Batteries, Carbone Corp., Carbon Products Division of Union Carbide Corp., Exide Industrial Division of Electric Storage Battery Co., Fansteel Metallurgical Corp., General Instruments Corp., Gould-National Batteries Inc., Kohler Co., LaMarche Manufacturing Co., Onan Division of Studebaker Corp., Parkersburg Rig & Reel Co., Railroad Accessories Corp., Schauer Manufacturing Corp., 3M Co., and U.S. Motors Corp.

● **Many ingredients.** The market potential mentioned above and elsewhere in this report is mainly for the microwave system itself. But there are many other communications devices that can be hung on a microwave system, namely telephone, telegraph and input devices. Suppliers include Automatic Electric Co., Buckeye Telephone & Supply Co., Graybar Electric Co., IBM Corp., Kleinschmidt Division of SCM Corp., Teletype Corp., and Trepac Corp. of America. Facsimile suppliers include A. B. Dick Co., Muirhead Instruments Inc., Stewart-Warner Electronics and Xerox Corp.

In the area of data-processing equipment and supplies, these manufacturers may be considered representative: Burroughs Corp., Control Data Corp., Digitronics Corp., Honeywell Inc., Navigation Computer Corp., Paper Manufacturers Co., and Remington Rand Univac.

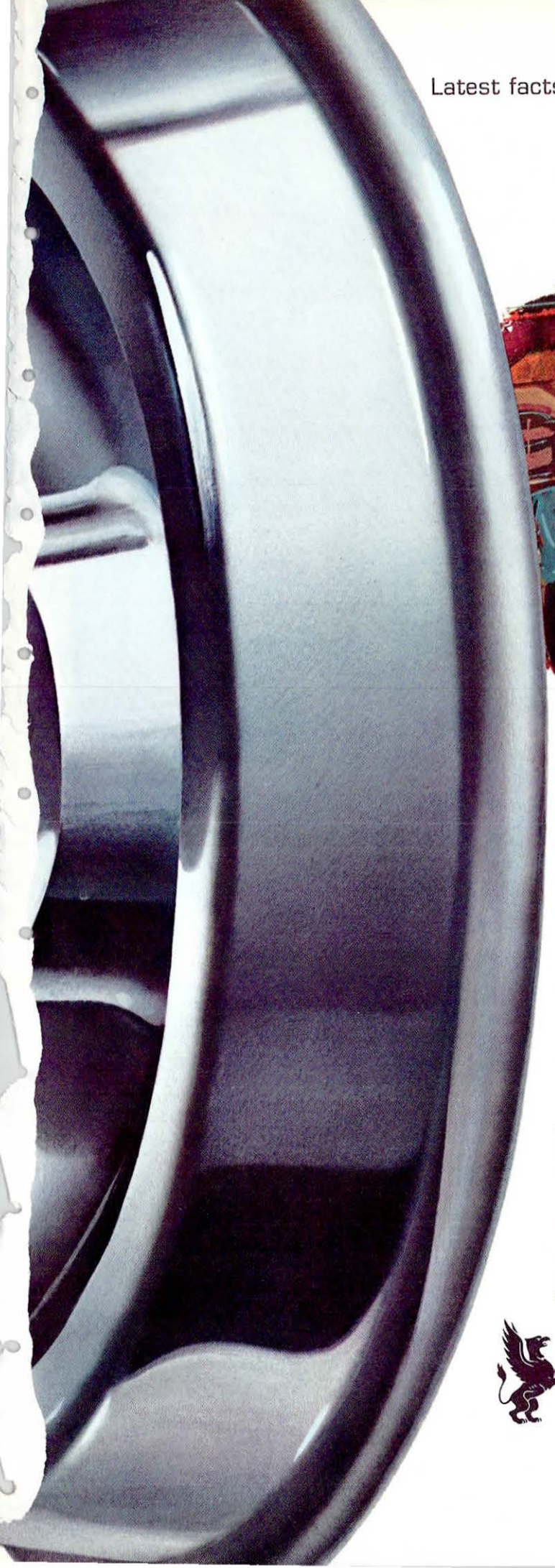
● **Test equipment, too.** Accurate, reliable test equipment and instruments are needed by industry servicemen to test, adjust and maintain microwave systems and components. The following suppliers represent this area of the microwave market: Cushman Electronics Inc., General Radio Co., Heath Co., Hewlett-Packard, Measurements Corp., Northeast Electronics Corp., Radiation Inc., Sierra Electronics Division of Philco, Sigma Instruments Inc., Stelma Inc., Tektronix Inc., Telemethods International, Towaco Electronics, Triplett Electrical Instrument Co., Western Railroad Supply Co. and Weston Electrical Instrument Co. and Western Electrical Instrument Corp.

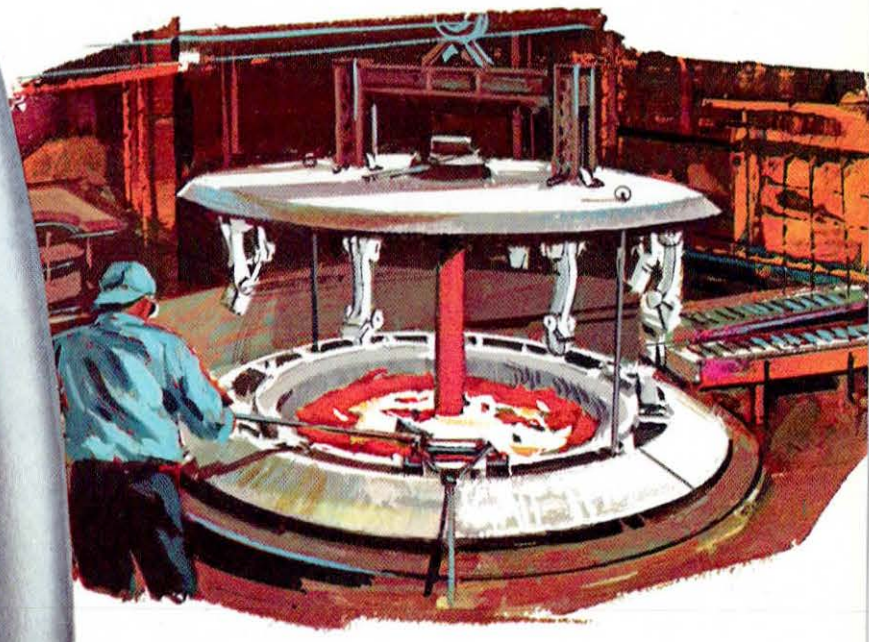
Other devices that can be hung on a microwave system are hotbox, dragging-equipment and high-wide-load detectors. Because of their widespread use and the centralized control that can be realized through communications, makers of these devices will probably share in the growing microwave market. Hotbox-detector manufacturers include General Electric Co., General Railway Signal Co., Railtron Corp. and Servo Corp. of America.

Another protective device that is achieving growing usage is a high-wide-load detector, made by Hanlon & Wilson. Roads such as the New York Central have installed several high-wide-load detectors and telemeter detections to centralized dispatcher locations. Several railroads are installing dragging-equipment detectors at hotbox-detector locations, and telemeter tripping of the detector into a centralized dispatcher's office or other operating headquarters.

Not only is the microwave market growing, but so is the market for other devices that require communications in order to be effective.

Latest facts about the strongest wheel on rails:





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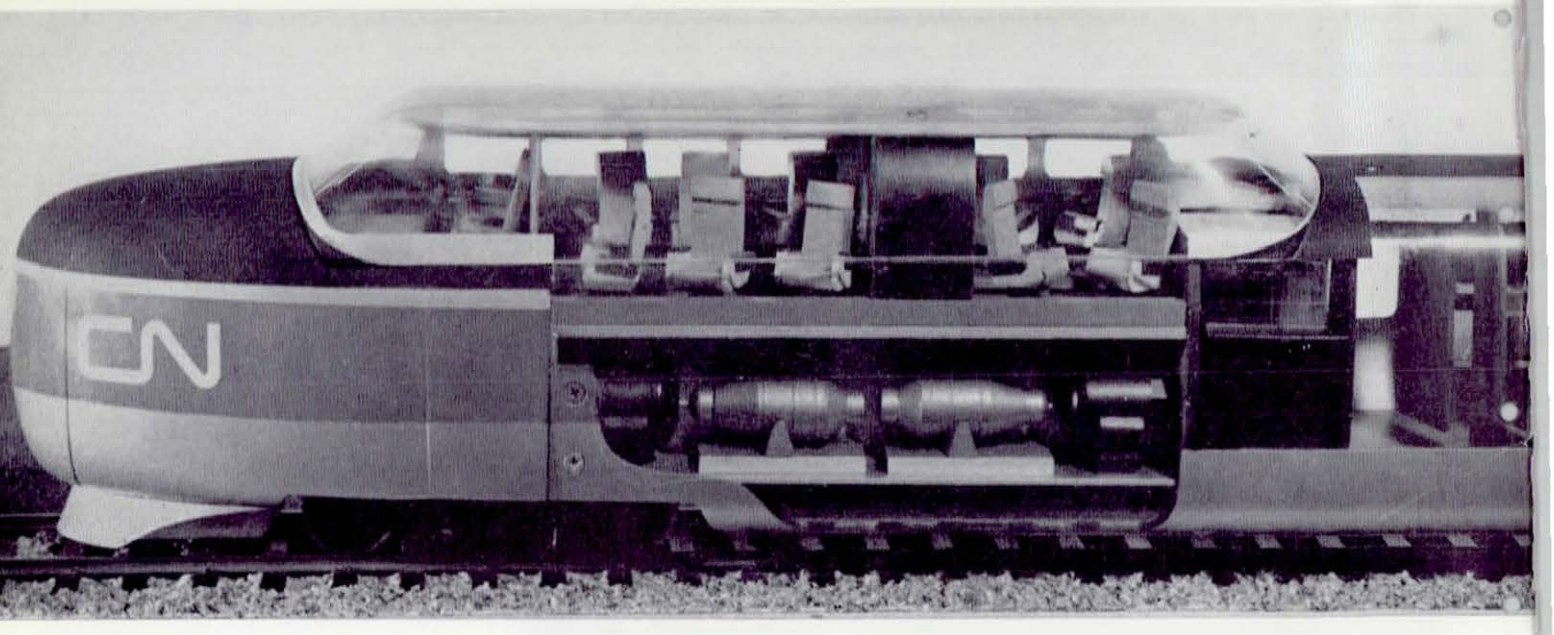
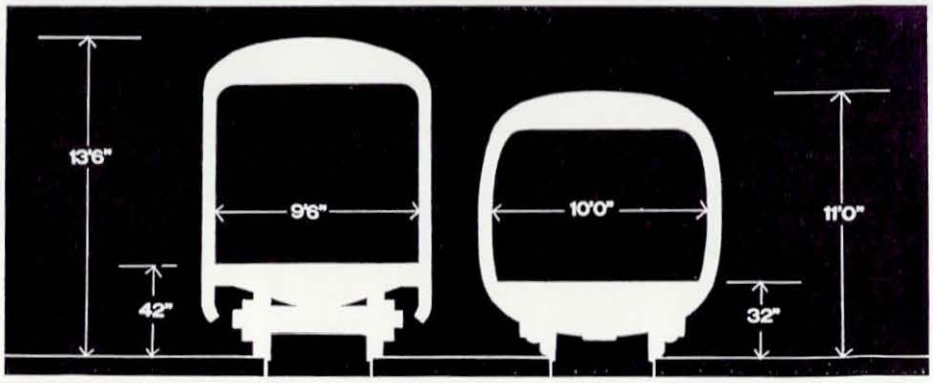


Turbo-trains coming to CN



HIGH POWER, LOW PROFILE promise speed; two 400-hp traction turbines are under dome floor (top). Center of gravity is lower than in conventional car (above).

United Aircraft will deliver five 7-car articulated lightweights in time for Expo '67; CN sees these trains' speed and comfort increasing its now profitable Montreal-Toronto patronage.

Gas-turbine-powered lightweight passenger trains have been ordered by the Canadian National for regular revenue service between Montreal and Toronto in 1967. The five 7-car trainsets, which wil be timed at less than four hours between Canada's two largest cities, are being acquired from U.S.-based United Aircraft Corp.

In announcing CN's contract award last week, President Donald Gordon explained that appraisal of several alternatives resulted in the choice of "Turbotrains" as the best answer for "fast, comfortable, economical and competitive equipment that will meet the desires of our customers and our own operational requirements."

• **U.S. testing.** The articulated CN trains will be enlarged versions of the two 3-car trainsets which were recently ordered from United Aircraft by the U.S. Department of Commerce, a $2.1 million phase of its $90 million Northeast Corridor research (RA, March 7, p. 26). The U.S. trains will be tested on the New Haven between Boston and Providence, R.I.; later reportedly on other parts of the road. These trains are being built by Pullman-Standard and are scheduled for delivery late this year.

Like their shorter U.S. counterparts, the CN trains will be powered by UAC Model ST6 gas turbine engines, each rated at 400 hp. These diesel-fuel-burning turbines, each 5 feet long and 1½ feet in diameter, are installed in the power dome cars which are located at each end of the trainset and contain the operator's compartment as well as passenger accomodations.

• **No warm-up.** The turbines do not require warm-up as do diesels and can reach full power in less than 30 seconds even when started at minus 60 degrees. They are virtually noiseless and vibrationless.

The CN trains will be assembled by Montreal Locomotive Works, a major subcontractor for UAC. Two trains, Gordon said, will be delivered in April 1967, two in May and one in June. A UAC spokesman pointed out that the firm has achieved "about 70% Canadian content in the finished trains." The ST6 gas turbines for all of UAC's forthcoming trains, U.S. and Canadian, are produced by United Aircraft of Canada. Alcan is supplying the aluminum for the CN cars.

• **Economical, attractive.** Analyses by UAC indicates that a seven-car turbine train of 340-passenger capacity, operating over a 330-mile route such as exists between Montreal and Toronto, would cost about 30% less per mile to run than a conventional train of the same capacity.

CN and UAC designers are working together to create an interior that will have a recognizable CN look while at the same time being completely new. Improved features will include more effective heating and air conditioning, greater noise suppression, more com-

fortable seating, and an "elegant" interior environment.

There will be carpeting throughout the train, tinted glass and adjustable shades at each seat, soft indirect lighting and individually controlled reading lights for each passenger. Parlor passengers, who will occupy about 25% of the passenger space, will be served meals and beverages at their seats from galleys in each car. Coach passengers will have service centers at several points in the train where they can obtain refreshments to take to their seats.

● **Pendulum suspension featured.** Floors of cars on the new train will be only 32 inches above the rail; over-all height 11 feet. The lower center of gravity, combined with a pendulum suspension and guided axles, will permit Turbotrains to negotiate curves 30% faster than is now possible, UAC engineers report.

The train will have composition shoe on-tread braking. All wearing components, whether turbines, wheel sets or air conditioners, can be replaced within an hour. It will no longer be necessary to hold cars out of service for repairs. To further improve utilization, the Turbotrain is bi-directional so that turning and switching at terminals may be eliminated.

● **Fixed size no handicap.** In the past, articulated trains have been handicapped by being of fixed size and capacity, unadaptable to changes in passenger loads. To increase the capacity of the Turbotrain, two or more sets can be coupled together. The streamlined ends are actually nose doors covering an automatic coupler and passageway.

● **High capacity.** Two of the 7-car sets will be operated in tandem on the Montreal-Toronto runs. The 14-car train of 680-passenger capacity will weigh about 600,000 pounds.

CN views the route as having the greatest profit potential of all its passenger services. Fare and service innovations on the line, utilizing only conventional equipment, have increased the number of passengers by 20% in just one year. "The service is currently profitable," says N. J. MacMillan, CN executive vice president.

Faced with the need for additional capacity in the Montreal-Toronto corridor, CN had two choices according to MacMillan: "Either to buy conventional equipment of basically outmoded design, or to seize the opportunity to move forward into a new age, overcoming the gap between present equipment and what could be built using available technology."

CN reportedly is trying to win an advance agreement with union leaders on smaller crews which would run through on the 330-mile line. ■

WATCHING **WASHINGTON** WITH WALTER TAFT

TAFT

CLOSE VOTES ON RAIL-TRUCK RATES—It was by 6-to-5 votes that the ICC made its recent determinations that joint rail-truck rates are subject to Sections 3(4) and 4 of the Interstate Commerce Act (RA, May 16, p. 7). One of the dissenting opinions, by Commissioner Charles A. Webb, predicts that the determinations are "probably not durable."

Under the Commission rulings, truckers joining in rates with railroads are subjected to tougher regulation than Congress prescribed for truck rates under the Act's Part II. That contains the Act's provisions for regulation of motor carriers. But Sections 3(4) and 4 are in Part I. That regulates railroads, and is silent as to truck rates or joint rail-truck rates. Section 3(4) prohibits railroads from entering interchange arrangements which discriminate against connecting roads, oil pipe lines, express companies or water carriers. The principal features of Section 4 require Commission clearance for charging a higher rate for a shorter distance than for a longer distance on the same route, and for charging more as a through rate than the aggregate of intermediate rates over the same route.

THE SECTION 4 RULING—The determination as to Section 4 is new only in the sense that it sanctions formally what the Commission has been doing for 30 years on a case-by-case basis. The formalizing came in a report by Commissioner Howard G. Freas in No. 34254.

The same report also announced the Commission's finding that Plans II and V piggybacking services do not differ to such an extent that no violation of Section 4 occurs when the rate for one of those services is higher to an intermediate point than the other service's rate to a more distant point on the same route. Plan II is door-to-door service in railroad equipment at railroad rates; Plan V is door-to-door service under rail-truck rates.

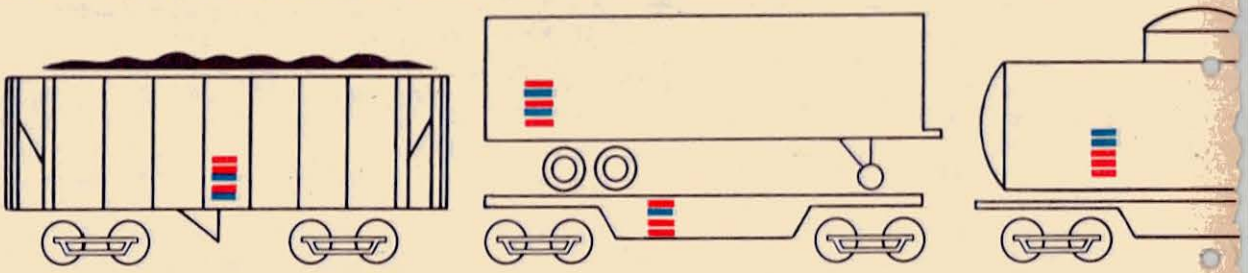
DID SILENCE GIVE CONSENT?—Supporting its claim to the power it has seized, the Commission rationalized that Congress must have wanted it that way. However, it seemed to rely more on the "silent acquiescence" of the transportation industry and Congress in what it has been doing. One of the dissents challenged this identification of silence as acquiescence. It said the matter had not been important to the transportation industry before the development of piggybacking—and "to suggest that the Congress acquiesced belies any knowledge of the operations of that body."

This opinion was written by Vice Chairman William H. Tucker and subscribed to by Commissioners Webb, Virginia Mae Brown and Willard Deason. The other dissenter was Chairman John W. Bush. He filed his own statement, as he did also in the case involving Section 3(4).

THE SECTION 3(4) RULING—The determination as to this section came in a majority report by Commissioner Paul J. Tierney in No. 34238. Complainants were water carriers competing with rail-truck services for the movement of oil country tubular goods into Texas and Oklahoma. The Commission does not require that the water carriers be cut in on the joint-rate arrangements—it lets the railroads and truckers decide how to end the discrimination.

It was with this report that Commissioner Webb filed his dissent predicting that the majority rulings would not endure. His expression was endorsed by Commissioners Tucker, Brown and Deason. The majority's reasoning could make rail-truck rates subject to all rate-making provisions of Part I, which are more restrictive than the rate provisions of Part II, Webb said. He added that the Commission's determination is "contrary to all relevant indicia of Congressional intent," and it "flies in the teeth of the last sentence of Section 3(4)." That confines the section's definition of connecting lines to carriers subject to Part I and water carriers, which are generally subject to Part III.

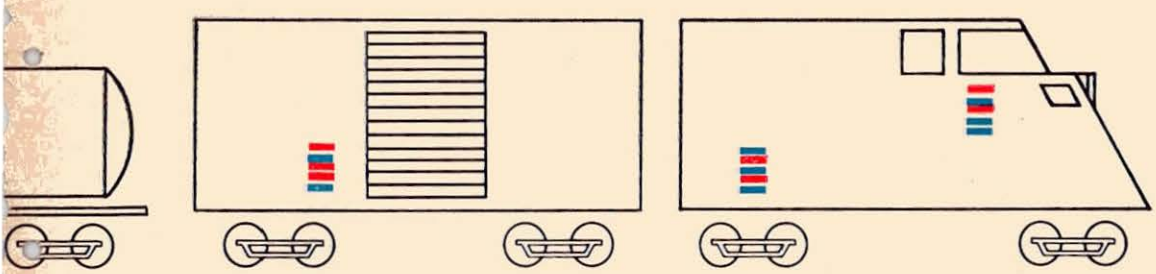
The KarTrak ACI system: bought by the Duluth, Missabe & Iron Range R.R. and other leading mining railroads.



The KarTrak* ACI scanning gives you versatility up and

Four railroads, with a total of 14,000 cars, have bought *our* system to improve their operations. The reason? Because we're the only ACI system that employs vertical scanning. And to railroads this offers more flexibility and more versatility than any horizontal scanning system or electronic system still in the testing stage.

Cars can be read whether travelling at high speeds or at a slow crawl. Used with coupled-in-motion scales, we can give immediate ne weight. We can read piggybacks, Flexi-Vans, any kind of container. And we can read multi-labeled cars, with our data decoder unit programmed to give only selective information: Dates, times, light weights, names of railroads, train direction, contents or types of cars.



system's vertical total flexibility and down the line.

With vertical scanning a car can be labeled with unlimited amounts of information. Positioning of these labels isn't at all critical. Anyone can place them on any car, anywhere within a six-foot vertical range. In minutes.

Variable information labels can conveniently be placed on a single car (train number positioned outside engineer's window). And data can be immediately sent from moving cars directly to customers or distant points on the line; or held in our buffer unit for later polling.

It's no wonder railroads have put their money on the line for the KARTRAK system. Why don't you? Write or call: KARTRAK System, Sylvania Electric Products Inc., P.O. Box 268, Bedford, Mass. 01730. Tel. 617-275-0300.

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AS THE EDITOR SEES IT...

WHAT HAPPENED, AND WHY—From a staunch but disgruntled friend on a midwestern railroad comes a non-fan letter commenting on our May 16 (State of the Passenger Train) issue. "I think the talk about the 'vanishing passenger train' should be changed to talk about the 'vanishing passenger train issue,'" our friend grumbles. "What the hell happened? I don't think I ever saw a smaller edition of Railway Age."

What happened was terribly simple, and may provide the saddest commentary of all on the state of the passenger train. That slim May 16 issue had the editorial message on passenger service, all right—seven thoroughly researched pages of it. What was missing was the passenger-related advertising that used to make this issue so wonderfully fat.

The facts are these: Four companies placed 2 and 5/6 pages of passenger advertising in the May 16 issue; and we happily print the honor roll: Union Pacific, Seaboard Air Line, Santa Fe, American Steel Foundries.

Ten years ago—in the May 21, 1956, "Passenger Progress" issue (when it could still be called that)—no fewer than 46 advertisers bought 56 pages of space to beat the drums for the passenger train. Twenty-one of them were railroads; others were suppliers peddling a variety of wares.

THE WINDS OF CHANGE—We're not complaining. Our May 30 issue will carry some 80 pages of paid space. But the subject will be piggyback—not passengers.

Nor are we saying that advertisers are wrong to put their money where the traffic is. Times—and markets—change.

PICKING UP THE BEAT—Our editorial program is not now, and never has been, tied to sold pages (though there's no denying the fact that since both editors and advertisers have to be where the action is, there's often a harmony of interest.)

All of this is to say that we're going to continue to beat the drums for the passenger train, when the time and the place seem appropriate, on the theory (to paraphrase an early observer of the railroad scene) that he who hears a different drummer may "step to the music which he hears, however measured or far away." Or, in non-Thoreau terms: Why let the airlines make all the noise?

Some readers will continue to feel that we're too bullish on the passenger side, and others will call us bearish. To which we reply that our policy on passenger service is still best expressed in the title of an editorial we printed in that wonderful year, 1956: "For the Passenger Business—an Axe *and* a Needle."

VIRTUE REWARDED—The United States Senate opened on Monday, May 9, 1966, with a prayer (by a visiting Methodist bishop from Arkansas) that righteousness prevail. There followed the passage of several bills relating to the disposal of metals from the national stockpile, spirited presentations on civil rights, truth in packaging, and screw-worm eradication, and then (page 9591, the Congressional Record) righteousness prevailed. The chamber that has heard so many unkind words said about the railroad industry now heard Senator Proxmire of Wisconsin declare: "There are few industries in this country that have had a rockier or tougher road than the railroads." As evidence that the railroads are making the grade, the Senator cited a cover story which Railway Age published March 21 on the Chicago & North Western and its chairman, Ben W. Heineman. Mr. Proxmire then asked and received unanimous consent to have the article reprinted in its entirety for the edification of all members of Congress. We hope it provides instructive reading. Convincing Congress that widows, orphans and the GNP have nothing to fear, and everything to gain, from strong railroads is not an easy task; but we keep trying.

Incentive per diem legislation is passed

Power to include incentive factors in per diem rates for rental of freight cars by railroads will come soon to the ICC—but it can't be exercised by the Commission until Sept. 1. The power is granted on that basis in the incentive per diem bill, S.1098, which Congress cleared and sent to the White House last week.

● **Twenty-year fight.** Congress' action marked a win for the ICC and railroad proponents (principally western lines) of legislation which has been before Congress for about 20 years. The drive for it got under way in the mid-forties, when the courts thwarted a Commission undertaking to use its present car-service powers to prescribe a penalty per diem rate. Because its members were divided, the AAR took no position on the legislation.

President Johnson is expected to sign the bill into law. In addition to its ICC support, it has been endorsed by government executive departments.

The Congressional clearance came May 17 when the Senate accepted House amendments to the bill which it passed originally last year. The House passed its version May 12.

● **Final version.** Among differences between the original Senate version and the final version is absence from the latter of specific reference to the "value of the use of freight cars" as something the Commission could consider in adding an incentive factor to the normal per diem rate. The chairman of the House Committee on Interstate and Foreign Commerce, Representative Harley O. Staggers (D.-W. Va.), explained that the Committee knocked out the reference because it was unsympathetic to the idea which it also considered unworkable.

Other provisions of the final version also set out the new grant of authority to the Commission in more general terms than those of the Senate version. However, the final version does prevent the Commission from adding an incentive factor to per diem rates on any type of car which it finds in adequate supply. And it may exempt any group of carriers from payment of the incentive charge if it finds the exemption in the national interest. ■

MARKET OUTLOOK

Carloadings

Loadings of revenue freight in the week ended May 14 totaled 611,161 cars, the Association of American Railroads anounced on May 19. This was an increase of 8,917 cars, or 1.5%, compared with the previous week; an increase of 17,303 cars, or 2.9%, compared with the corresponding week last year; and an increase of 34,819 cars, or 6%, compared with the equivalent 1964 week. Ton-miles generated by carloadings in the week ended May 14 are estimated at 15.1 billion, an increase of 8% above the corresponding week of 1965, and 15.8% above the 1964 week.

REVENUE FREIGHT CARLOADINGS
For the week ended Saturday, May 14

District	1966	1965	1964
Eastern, including Allegheny and Pocahontas ..	246,027	243,056	235,947
Southern	122,120	120,544	111,689
Total Eastern and Southern Districts	368,147	363,600	347,636
Northwestern .	88,966	79,095	81,611
Central Western	113,875	111,438	109,282
Southwestern .	40,171	39,725	37,813
Total Western Districts	243,014	230,258	228,706
Total All Roads	611,161	593,858	576,342
Commodities:			
Grain and Grain products	49,826	45,022	40,997
Livestock	1,967	2,018	2,304
Coal	116,431	108,757	108,215
Coke	9,191	8,530	7,854
Forest Products	41,286	38,732	38,326
Ore	56,480	50,303	56,546
Merchandise l.c.l.	6,185	9,670	12,810
Miscellaneous .	329,795	330,826	309,290
May 14	611,161	593,858	576,342
May 7	602,244	591,181	566,330
April 30	574,093	592,982	553,142
April 23	543,639	570,489	558,647
April 16	543,049	547,742	569,321
Cumulative total, 19 weeks ...	10,430,732	10,315,996	10,047,776
Estimated revenue ton-miles (billions) 19 weeks ...	262.0	244.1	234.6

PIGGYBACK CARLOADINGS.—U.S. piggyback loadings for the week ended May 7 totaled 22,840 cars, carrying 37,514 trailers, compared with 19,964 cars, carrying 32,148 trailers, in the corresponding 1965 period. Loadings for 1966 up to May 7 totaled 381,126 cars, carrying 630,059 trailers, compared with 343,715 cars, carrying 553,305 trailers, in the corresponding period of 1965.

IN CANADA—Carloadings for the nine-day period ended April 30 totaled 102,370 cars, compared with 81,072 for the previous seven-day period, according to the Dominion Bureau of Statistics.

	Revenue Cars Loaded	Total Cars Rec'd from Connections
Totals for Canada		
April 30, 1966	102,370	31,919
April 30, 1965	99,218	33,988
Cumulative Totals		
April 30, 1966	1,276,633	442,523
April 30, 1965	1,179,279	415,573

FREIGHT-TRAIN CARS

► *Pittsburgh & Lake Erie.*—Ordered 50 125-ton-capacity cars for carrying coil steel from Evans at a cost of $1.2 million. The "breadbox-type" cars have integral steel hoods that open like the lid on a breadbox. They have 52-ft troughs, all-weather sealing, cushioned underframes and adjustable cross members. P&LE expects delivery of the new cars to begin in July.

► *Suburban Fuel Tank Car Co.*—Ordered 11 new 100-ton, 33,200-gallon tank cars from Shippers' Car Line division of ACF at a cost of approximately $250,000. The 65-ft cars, called "Rail Kings" by ACF, will be leased by Suburban Fuel to bottled gas distributors.

► *Union Pacific.*—Plans to spend an additional $32,157,000 for more new equipment for delivery this year. This will put UP's total rolling stock program at $173 million. Orders will include 750 freight cars to be built by car-building firms, of which 650 will be double-door 70-ton box cars; 100 70-ton insulated cars; 100-ton open-top hoppers; and 15 89-ft flat cars for piggyback service. UP will also participate in the purchase of 500 40-ft mechanically-refrigerated highway trailers for shipping perishables by piggyback through Pacific Fruit Express, which is jointly owned with Southern Pacific.

LOCOMOTIVES

► *Union Pacific.*—Plans to buy an additional 45 diesel-electric freight locomotives this year with part of the $32.1 million in funds added last week to the railroad's 1966 equipment program. The new power will include forty 3000-hp and five 2,800-hp units.

PASSENGER CARS

► *Pennsylvania.*—Bids have been requested from car builders for 40 air-conditioned, stainless-steel electric commuter cars for use on the PRR's Trenton-New Brunswick-Newark-New York line. The cars will be purchased in cooperation with the State of New Jersey. They will have seating for upwards of 120 passengers, center and end doors for fast loading and unloading, and will be capable of speeds close to 100 mph. PRR expects to order the cars in July for delivery in the summer of 1967.

CAPITAL EXPENDITURES

► *Southern Pacific.*—Will spend $133 million in 1966 on equipment acquisitions. Included will be 5,137 freight cars, at a cost of $88 million, and 172 new locomotives, costing $45 million.

NEW FACILITIES

► *General American.* The Terminals Division of GATX has acquired 87 acres of undeveloped land adjacent to the division's Galena Park terminal in Houston, Tex. The property is along the Houston Ship Canal bordering the existing GATX terminal, which has a storage capacity in excess of 1.5 million barrels. The facilities are used to store, blend and package a wide variety of chemicals, foods, petroleum, and petro-chemical products on a lease basis. Part of the new site will be used for a plate and welding division facility to fabricate basic tank components.

YOU OUGHT TO KNOW

Freas won't seek ICC reappointment: Commissioner Howard G. Freas of the ICC advised his fellow Commissioners last week that he will not seek reappointment when his present term expires at the end of this year. Freas is now on sick leave, but his decision to retire is understood to have been reached before he became ill. He is in his 66th year. One of the Commission's five Republican members, he has served since 1953 when he was appointed by former President Eisenhower.

PRR-NYC merger date postponed: The date on which the ICC-approved merger of the Pennsylvania and New York Central may be consummated has been set back to July 29, from June 1. The postponement came from the Commission in response to a joint request of PRR, NYC, Erie Lackawanna, Boston & Maine, and Delaware & Hudson. Meanwhile the deadline for filing petitions in the case became June 27.

RPI deadlines set: Railroads aiming to add a Golden Freight Car to the trophy case have until June 30 to file their intent-to-enter with the Railway Progress Institute, sponsor of the annual award for effectiveness in freight-traffic promotion. Deadline for entries, supporting documents and exhibits will be Aug. 31. Winner of the top award in 1965 was New York Central.

CLC elects BLF&E officer: A. R. Gibbons, vice president and Canadian legislative representative of the Brotherhood of Locomotive Firemen & Enginemen, has been elected a general vice president of the Canadian Labour Congress—an unusual honor for an officer of a U.S.-based rail labor organization, according to the BLF&E. Gibbons also heads the Canadian Railway Labor Executives' Association.

Medal of Honor for railroader: Howard E. Ratcliff, station agent for the Northern Pacific at Plains, Mont., was presented a Medal of Honor last week for performing an heroic act while on duty. The medal, approved on behalf of President Johnson, was presented by ICC Chairman John W. Bush in Washington. Ratcliff saved a woman's life a year ago, rescuing her from the path of an oncoming train as she attempted to cross the tracks. The Medal of Honor is awarded for acts of heroism, involving trains or motor vehicles, upon the recommendations of the ICC to the Secretary of Commerce.

New officers for C&NW: Ben W. Heineman, chairman and chief executive officer of the Chicago & North Western, was elected chairman and president of the road following the annual meeting last week. For reasons of health, Clyde J. Fitzpatrick was not re-elected president, but will continue as a director. Larry S. Provo, vice president, finance, was elected executive vice president.

RI's costly 'Rocket': Rock Island will ask the ICC for permission to discontinue western-end operation of one of the nation's better-known (but little patronized) name trains, the "Rocky Mountain Rocket." The petition will cover Omaha-Denver-Colorado Springs operations of trains 7 and 8—operations which RI says are incurring an annual out-of-pocket loss of $664,000. R. W. Anderson, general manager-passenger services, says the road plans to continue operations of the trains between Chicago and Omaha, where 7 and 8 are at a break-even point.

RRB picks Travelers: Travelers Insurance Co. has been appointed by the Railroad Retirement Board as sole intermediary for handling claims of railroad employees and annuitants under the medical-services part of Medicare. The appointment was made under powers granted RRB by the Department of Health, Education and Welfare and with a recommendation from rail management and labor.

Truck tonnage: Intercity truck tonnage in the week ended May 7 was 0.5% below that of the previous week of this year, and 4.3% ahead of the volume in the corresponding week of 1965.

Current statistics

Net Income	
3 mos., 1966	$172,000,000
3 mos., 1965	123,000,000
Carloadings, revenue freight	
19 wks., 1966	10,430,732
19 wks., 1965	10,315,996
Freight cars on order	
Apr. 1, 1966	54,541
Apr. 1, 1965	36,491
Freight cars delivered	
3 mos., 1966	22,041
3 mos., 1965	19,608
Serviceable cars	
Apr. 1, 1966	1,406,470
Apr. 1, 1965	1,401,170

PEOPLE

DETROIT & TOLEDO SHORE LINE.—**Harry A. Sanders** elected president. **W. S. Clement** named vice president, and **Forbes B. Henderson,** secretary.

DETROIT, TOLEDO & IRONTON.—**Carl L. Froehlich,** district sales manager, Chicago, is now in charge of the Chicago Office. He assumes the duties of **Harold A. Mewes,** general western agent, who retired March 31.

GRAND TRUNK WESTERN.—**Victor P. Kendall,** assistant purchasing agent, **Canadian National,** Montreal, named purchasing agent, **GTW,** Detroit, to succeed **Dixon Bennett.**

KANSAS CITY SOUTHERN.—**Eldon D. Pence** named assistant to vice president-traffic, Kansas City, Mo.

M. F. McClain appointed supervisor of freight equipment and service, Shreveport, La.

MERIDIAN & BIGBEE.—**Marvin V. Dendy,** superintendent, appointed vice president—operations, Meridian, Miss. **John R. Henry** elected secretary of the road.

MISSOURI - KANSAS - TEXAS. — **Raymond B. George,** general superintendent, named general manager, with headquarters at Dallas and Denison, Tex. Mr. George will assume the duties and responsibilities formerly vested in the office of vice president-operations, which position discontinued with the resignation of **Thomas S. Carter,** who becomes associated with the **Evans Construction Co., Inc.,** Fort Smith, Ark.

Billy R. Bishop, chief mechanical officer, named general superintendent transportation-mechanical, Denison, and will continue to have supervision over the car and locomotive departments. **Glen O. Prideaux** is superintendent car department. Heading the locomotive department is **David F. Pilkinton,** formerly shop superintendent, Parsons, Kans., who is advanced to the newly-established post of superintendent motive power. **Paul W. Larery,** gang foreman, replaces Mr. Pilkinton at Parsons. **Martin F. Rister** named to the reestablished position of superintendent of air equipment and diesel operation, with headquarters at Denison. Mr. Rister was formerly assistant to that position. **M. D. Woodruff,** trainmaster, named road foreman of engines, Denison.

Robert W. Schmidt, sales manager, Milwaukee, transferred to Dallas, to succeed **J. Frank Coghlan, Jr.,** resigned. Mr. Schmidt's successor is **John J. Miele,** sales representative, Cincinnati.

Raymond B. George
M-K-T

Billy R. Bishop
M-K-T

Supply Trade

Edward M. O'Neill has been appointed sales-service representative, Rail Anchor Division, **True Temper Corp.,** at Lake City, Pa.

Gilbert M. Warren has been named assistant vice president-sales, **Keystone Railway Equipment Co.**

Cambridge Scientific Industries, Cambridge, Md., has purchased outright **Summit Electronics,** Baltimore, Md., specialists in manufacture of railroad electronic controls. Summit will be operated as a wholly owned subsidiary of Cambridge with all manufacturing and business offices within the physical confines of the existing Cambridge facilities.

Dr. Robert B. Blodgett, director—research, **The Okonite Co.,** Passaic, N. J., has been appointed vice president—research. **Joseph R. Happley,** sales representative, Minneapolis, Minn., has been appointed district manager, Minneapolis territory.

Ronald W. Dearwater has joined the Los Angeles sales staff of the **Okonite Co.**

William S. Wilson, special engineering representative, Railroad Sales Department, **Mobil Oil Co.,** Chicago, appointed manager of railroad sales, succeeding **C.F. Garney,** who has been transferred to New York.

On April 26, **American Brake Shoe Co.** became the **Railroad Products Division** of **Abex Corp.**

OBITUARY

John J. Bolger, 60, district sales manager, **Norfolk & Western,** died May 12 in Copley, Memorial Hospital, Wheaton, Ill.

William C. Borchert, 72, retired division engineer, **Louisiana & Arkansas,** died April 18 at Shreveport, La.

James R. Douglass, assistant chief mechanical officer, **Louisville & Nashville,** died May 9 at his home in Louisville, Ky.

John C. Keene, 78, vice president, **Illinois Railway Equipment Co.,** Chicago, died May 4 at Michigan City, Ind.

Albert W. Schroeder, former president of the **Minneapolis & St. Louis,** died April 30 at Tucson, Ariz.

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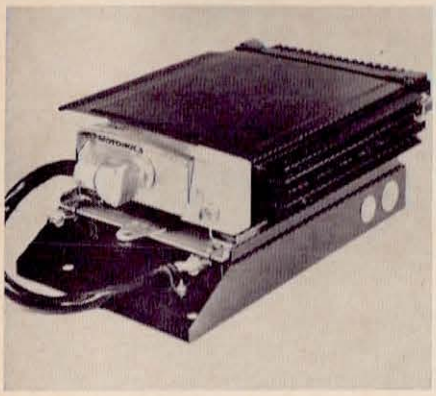
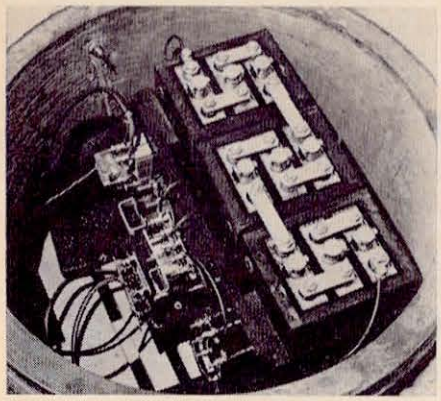


Railroad Radio (RA-1)

A new all solid-state 35-watt two-way radio has improved receiver stability and intermodulation rejection. Also, in the transmitter, power output, efficiency and oscillator stability have been improved while distortion has been reduced. Known as Motran, the new models meet or exceed AAR specifications. The units are interchangeable with all existing Motorola Motrac series equipment.

Increasing the intermodulation rejection to 80 db means an improvement of more than 5 to 1 in protecting the receiver from interference. The receiver's audio distortion has been reduced 5%, a 2 to 1 improvement.

Operating power for the Motran can be either 12 or 64 volts DC. The standard radio can use from one to four frequencies. Special circuitry guards the power supply and final amplifier transistors against damaging overloads. The radio has preaged transistors, heavy duty circuit boards, metering and top tuning. *Motorola.*



Storage Batteries (RA-2)

A new line of nickel cadmium alkaline storage batteries, designed for railroad signaling and communications, is available in two series: type RP, in translucent plastic containers for fast check of electrolyte level, and type RS, in nickel-plated steel containers. Capacities range from 9.6 to several hundred ampere hours.

Among the applications for which the new batteries are particularly economical are: track circuits, crossing protection, CTC, and microwave communications.

The new nickel cadmium batteries combine low charge voltage with high discharge voltage, eliminating the need for high float voltage required by nickel iron batteries. They seldom need water, and terminals stay free of corrosion deposits; eliminating the need for periodic clean-up, thus reducing maintenance. This low-maintenance feature is an important element in supplying stand-by power in remote, unattended, or inaccessible installations. *Nife Incorporated.*

Computer Display (RA-3)

The Control Data 210 system is an on-line, electronic typewriter/display system that quickly communicates with a digital computer from remote stations. Each station consists of a keyboard and bright cathode ray tube display. The 210 may be connected to a computer or data system by direct cable or by a telephone subset. Up to 63 stations may be operated from a single central control unit which is capable of handling more than 20,000 inquiries or entries per hour.

The 210 display page contains 1,000 character positions arranged in 20 lines of 50 characters each. Composing messages in the 210 system is much like using an electric typewriter. Characters are stored in the buffer memory in the central control unit. The stored message is displayed on the cathode ray tube screen. After verifying the inquiry or entry, the operator presses one of the function keys and the data are sent to the computer. Transmission is at computer speeds. All operator editing functions are performed within the 210 system and do not require computer communication or programming. *Control Data Corp.*

Stacker Crane (RA-4)

Any bridge crane can be turned into a stacker crane for less than $1,000 with PIK-FORK. The device uses a bridge crane, monorail or hoist, providing right-angle stacking from any overhead system. It is equipped with automatic self-leveling. Capacities to 4,000 lb are being produced; heavier capacities will be made available. No changeover time is required. The crane hooks directly onto PIK-FORK and is ready to go. *Frazier Industrial Co.*

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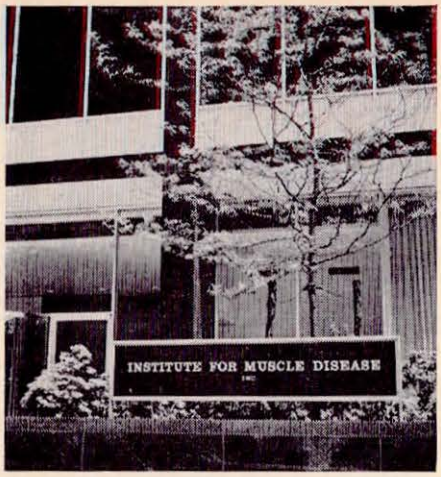

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THE ACTION PAGE

The FCC's impact on the railroads

Federal regulation of railroads by the Interstate Commerce Commission draws most of the darts from industry managers and transportation thinkers. But, regulatory moves by other government agencies seriously affect decisions being made by private managers. Microwave (see page 18) is a case in point.

The Federal Communications Commission licenses railroads for VHF radio and microwave systems. More subtly, however, the FEC exerts powerful influence upon rail industry communications decisions via its regulation of the telegraph and telephone industries.

Some roads have installed microwave systems. Some roads have taken advantage of American Telephone & Telegraph's low-tariff Telpak service to secure long-distance circuits between major terminals.

A recent FCC decision on Telpak, however, has the industry's communications experts working overtime as they re-examine the economic equations involving private microwave systems and leased systems. The FCC has tentatively ruled that Telpak systems with 12 and 24 channels have charges too low for competitive necessity and that the larger Telpak units (60 and 240 voice channels) are not compensatory at present rates. Telpak users have taken the Communications Commission to court, trying to overturn the decision.

The railroad point of view

Judges at the U.S. District Court of Appeals now wrestling with this complex issue are not likely to view the matter through the eyes of a railroad manager—but perhaps they should try.

Great changes are altering the railroads, and those changes depend heavily upon the industry's communications capacity and cost. The emergence of microwave systems on railroads since the late Fifties indicates just how fast the industry is building toward more capacity for change.

The nature and pace of development in this essential area of operations is visible evidence of how desperately the industry needs to be able to outline its future needs predictably and with a systems approach.

Too often a railroad's communications plant is the result of past pressures and patchwork. Growth, for too long, has been a matter of adding a teletype circuit or a telephone—in response to a specific and pressing need.

In the view of most industry experts, such tactics are not going to work for very long. The information explosion is throwing immense demands upon existing systems. Railroads able to handle additional data loads will move more quickly toward internal efficiencies than will roads unable to handle modern operational and computer traffic. Such roads will find themselves under increasing competitive handicaps in the battle for traffic.

The future is involved, too

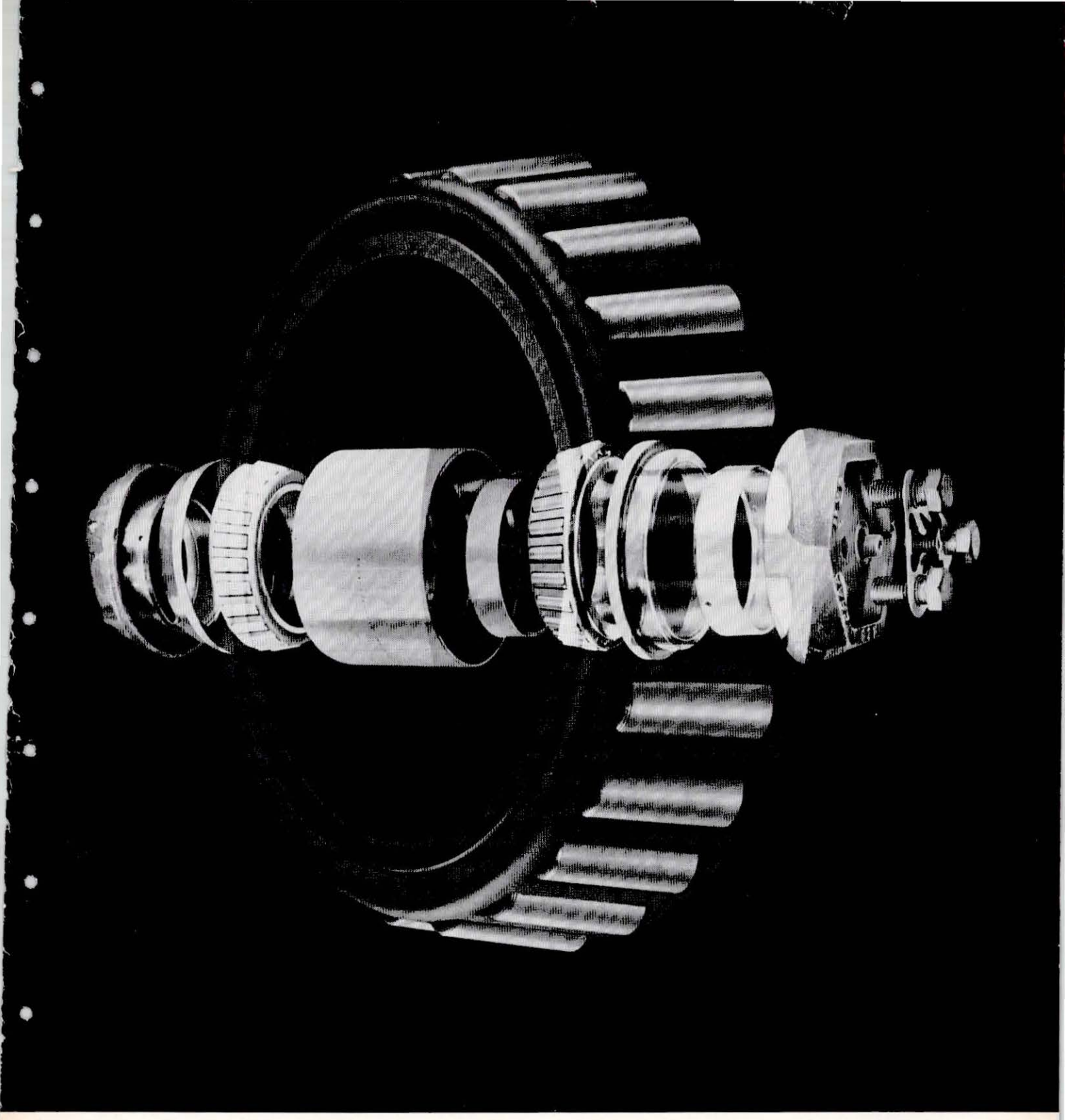
Railroads need to work toward a well-reasoned communications plant having both flexibility and a future.

The high expectations of industry managers from computerization, management control systems, automatic car identification systems, hotbox detector networks, high and wide load warning systems, equipment utilization programs and other system-wide techniques and gadgetry—all comprise awesome warning of things to come. When one adds to these the rising requirements for message, voice and radio traffic, the need for systematic planning and for economic definitions that are stable (from the FCC) are obvious.

It takes no great insight to see that the industry's communications are the nerve-paths managers use to coordinate and control effort and operations. It is just as obvious that betterments everywhere in the industry depend upon this basic communications capacity.

The railroads that have already taken steps to make sure they have the communications to back up current and future innovation did not do so haphazardly. Systems planning involves good, hard looks at the communications requirements of the future.

Such analysis, however, will be difficult until industry experts can put reasonable faith in economic projections covering the next 20 years and beyond. General unrest in the federally-regulated communications area has been caused by the Telpak opinions and by the FCC's current general investigation of the rates of AT&T. While not scaring anyone away from planning, such events have caused unnecessary ambiguity for railroad officers and communications planners.



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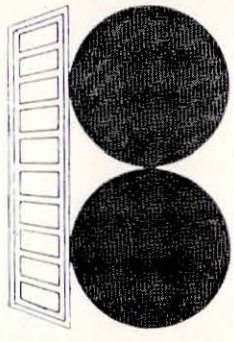

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MAY 23

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From the perma-frost areas of the Alaska Railroad . . . down through the mountainous 800 mile route of the Pacific Great Eastern Railroad . . . along the top of the continent serving the Denver and Rio Grande Western Railroad . . . and meeting the challenge of heat and cold serving over 1100 route miles of the Atchison, Topeka and Santa Fe Railway— years of service prove the value of rugged Motorola microwave design in railroad operation.

Today, Motorola's advanced solid state design meets increased reliability demands fully and completely. As the "backbone" of system-wide *coordinated* communications, Motorola microwave helps to reduce railroad operating costs. Overall control and efficiency is increased. You can take full advantage of dispatcher controlled 2-way radio communications . . . CTC . . . Direct Long Distance Dialing . . . data, facsimile and closed circuit television transmission. Additional voice and telegraph channels reduce communication delays.

Call or write for the facts. Let years of railroad microwave experience . . . advanced solid state equipment reliability . . . and the industry's broadest range of VHF radio "team-up" to prove that Motorola can do the job right for you!

MOTOROLA *MICROWAVE*

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